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The
BLUE JAY

A JOURNAL OF NATURAL HISTORY AND CONSERVATION
FOR SASKATCHEWAN AND ADJACENT REGIONS

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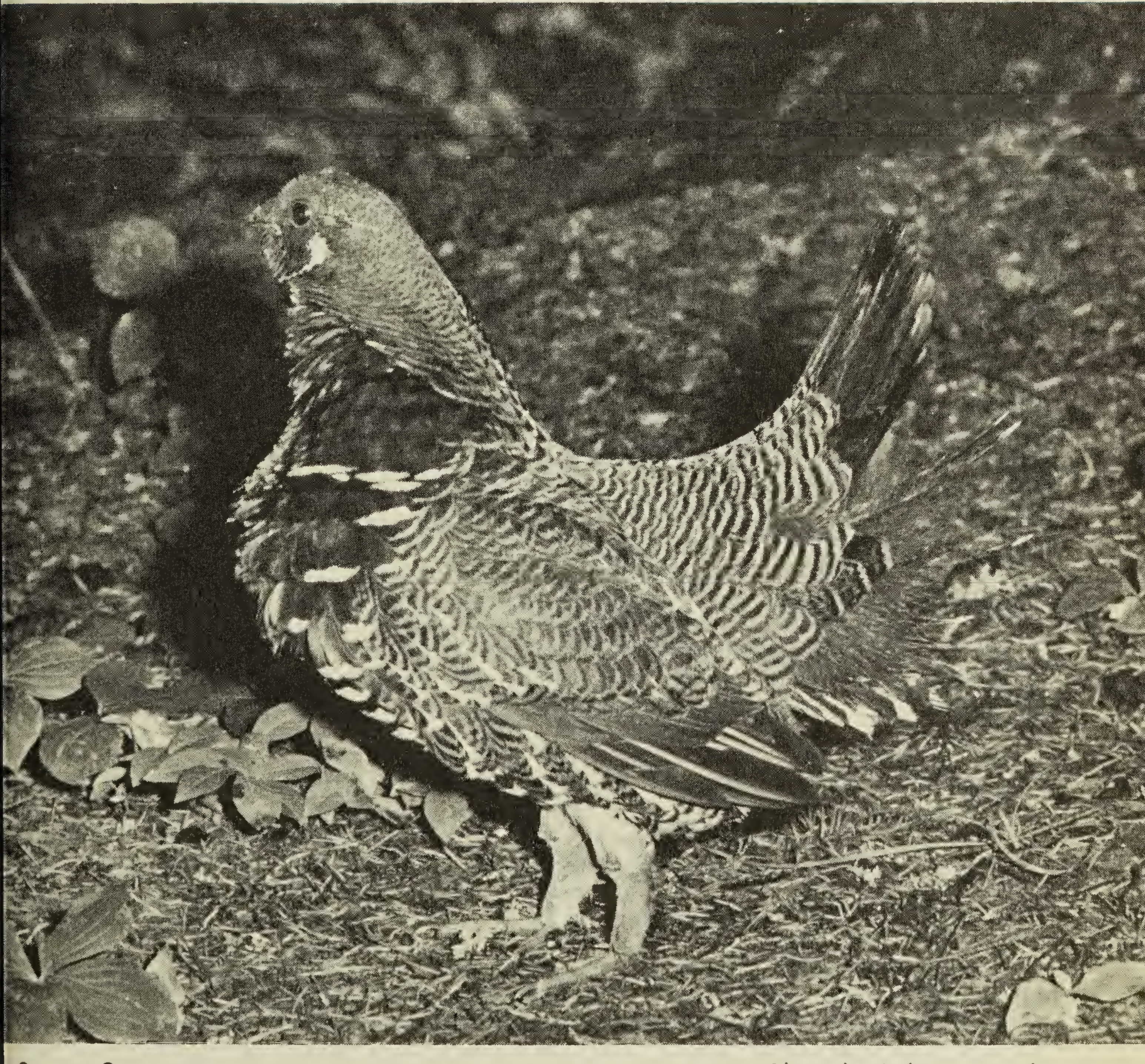

Spruce Grouse Photo by Robert R. Taylor

Published quarterly by the
SASKATCHEWAN NATURAL HISTORY SOCIETY
Regina, Saskatchewan

EDITORIAL

The *Blue Jay* began as a mimeographed quarterly with only a few pages per issue. The membership fee was 25 cents per year. The present *Blue Jay* has somewhat over 200 pages per year, and the lithograph process allows use of photographs to illustrate the articles. Our society membership fee of two dollars barely covers the printing costs of the *Blue Jay,* but many members also give donations which enable the Saskatchewan Natural History Society to undertake other activities in natural history and conservation.

Perhaps the most successful of these additional activities has been the printing of Special Publications. In the past ten years six publications have been printed:

1. A Guide to Saskatchewan Mammals. W. H. Beck. 1958. 52 pp. 50¢.
2. The Birds of the Saskatchewan River, Carlton to Cumberland. C. S. Houston and M. G. Street. 1959. 205 pp. $1.50.
3. Birds of Regina. Margaret Belcher. 1961. 76 pp. $1.00.
4. The Blue Jay Index, 1942-60. Joyce Deutscher. 1962. 36 pp. $2.00.
5. Birds of the Lake Athabasca Region, Sask. R. W. Nero. 1963. 143 pp. $2.50.
6. The Birds of Northeastern Sask. R. W. Nero. 1967. 96 pp. $2.00.

Another publication of the society that is often missed because it does not belong to the numbered series is Frank Roy's list (mimeographed) of the *Birds of the Elbow* (1964. 33 pp. 50¢). Before the end of 1968, it is hoped that the seventh Special Publication will appear in print, Manley Callin's *Birds of the Qu'Appelle Valley.* It seems worthwhile listing these publications with their prices, for many of our new members may not know that they are available. Orders for any of these publications may be sent to our Treasurer, Frank Brazier, Box 1121, Regina.

The Society takes pride, too, in other natural history publications written by its members but published under other auspices. Some of these, such as Leith Knight's recent *Birds of the Moose Jaw Area* (1967. 73 pp. $1.50), have been supported by local natural history societies, and others have been published independently of any organization. In order that our readers will know about them, we are glad to review these books in the book review section of the *Blue Jay* and in the *Newsletter.* In this issue, for example, Stuart Houston describes Doug Gilroy's beautiful *Album of Prairie Birds* in which familiar coloured photographs from Doug's "Prairie Wildlife" column are reproduced.

One book which we must certainly mention is R. D. Symons' *Hours and the Birds,* which Mrs. Cruickshank is reviewing in this issue. The Society has a special interest in this book because it gave financial support to allow the inclusion of 17 of Mr. Symons' appealing water colours. We congratulate Mr. Symons on his work, and are happy both for his sake and the Society's that the book has been so well received throughout Canada and the United States. Royalties allowed us by the author and a percentage of any sales of the book made through our Bookshop will enable us gradually to recover our contribution and to support other projects.

It can be seen that though our first Special Publication dealt with Saskatchewan mammals, our publications since then have been concerned mainly with birds. It is our hope, however, that future booklets will deal with many aspects of natural history.

Our Society has taken further responsibility for the encouragement of the study of nature and for the conservation of wildlife species by the acquisition of two sanctuaries. One of these is in the southwest of the province for the protection of the Prairie Dog, and the other to the northeast in quite a different life zone, where a half section of the countryside dear to Maurice Street is being preserved as a memorial to him. We shall visit this new sanctuary at Nipawin at the time of the Summer Meeting on June 14-16, 1968. At the present time, Stan Riome and his friends are finishing the sign which will be erected, honouring Maurice Street in these words:

"His life was man and nature at one."

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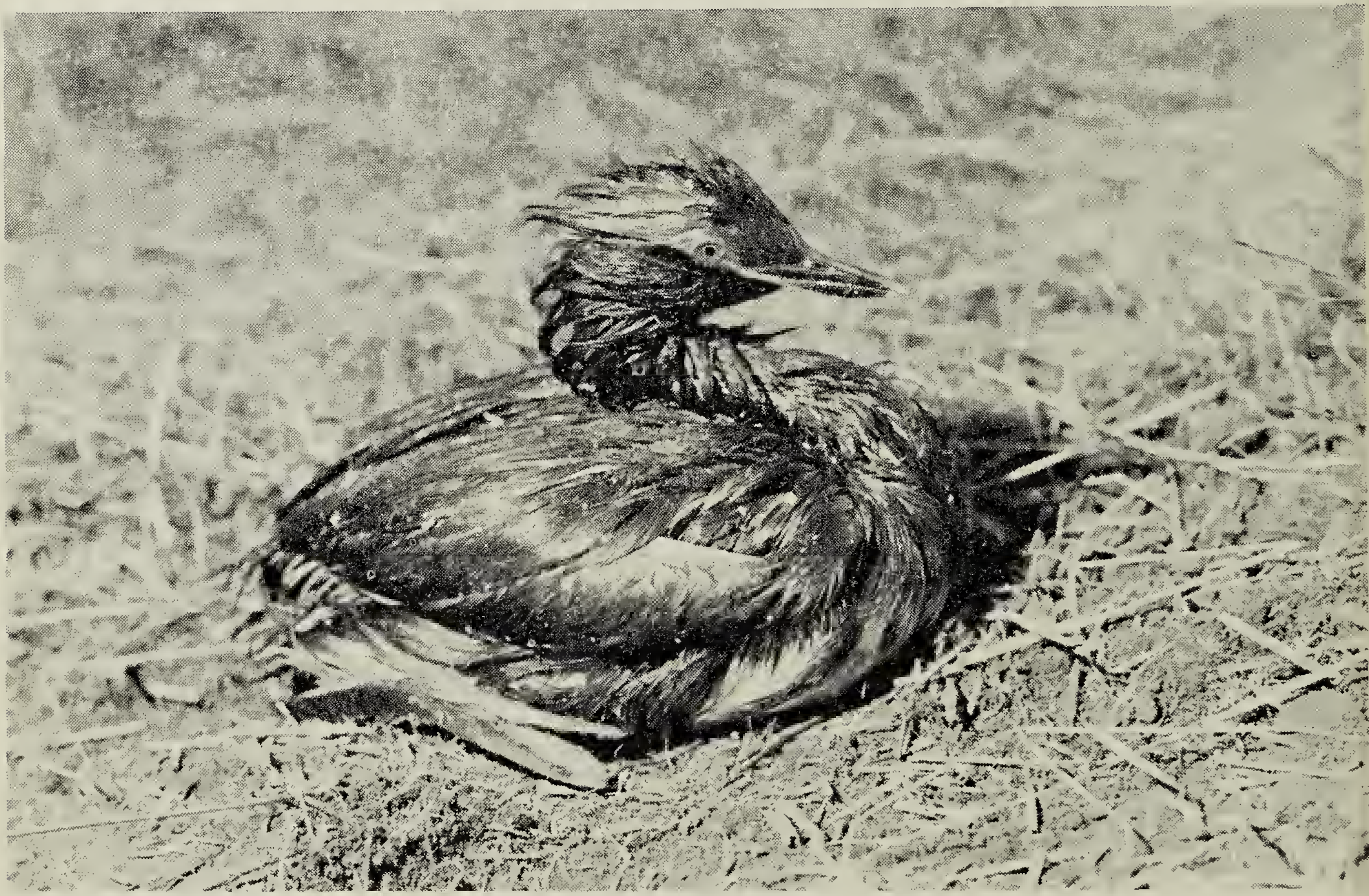
WET WATERBIRDS — A PROBLEM AT SEWAGE LAGOONS

by **Robert W. Nero**
Photographs by **Robert R. Taylor**
Manitoba Museum of Man and Nature, Winnipeg

Bird watchers across the continent are becoming increasingly aware that sewage lagoons attract large numbers of birds. Indeed, several groups now regularly list an "aroma route" on their birding schedules. The sewage lagoons at Regina, Saskatchewan, which are two artificial bodies of water of about 120 and 130 acres each, have proven a boon to local birders. In late summer, when there seems to be considerable food available, surprising numbers of birds may congregate. On August 16, 1964, for example, we saw an estimated 2000 Shovelers and 5000 Franklin's Gulls busily feeding in the lagoons. The Regina lagoons attract fewer birds in the spring when there is probably little food and when the effluent is more concentrated. To exhausted, night-flying spring migrants, the lagoons must seem a welcome haven. However, these waters may be potentially dangerous. In the spring of 1963 we found at least 24 Horned Grebes suffering from "wet-feathering" or loss of waterproofing, a peculiar condition evidently resulting from their immersion in the lagoon water (R. W. Nero. 1964. Detergents —deadly hazard to water birds. *Audubon,* 66:26-27). Loss of waterproofing is a dangerous condition, for wet waterbirds are easily chilled and they may succumb to cold water and wind. Furthermore, in their efforts to stay out of water, they become exposed to land predators.

Further observations of loss of waterproofing in grebes and other waterbirds were made at the Regina lagoons in the spring of 1964. Our first



Thoroughly wet Horned Grebe sitting on the roadway, Regina sewage lagoon.

record was a wet Horned Grebe found on April 25. More startling was a mixed flock of 19 wet grebes found late in the evening of May 8. The flock consisted of 17 Western Grebes, one Horned Grebe, and one Eared Grebe. These birds were sprawled out on a grassy slope on the edge of one of the two lagoons, the Western Grebes, especially, making an unusual and dramatic picture of stranded birds. They had evidently arrived during the previous night (we had checked the area daily), hence had been in the lagoon less than 24 hours. (Four other Western Grebes were seen on the same ponds, and 13 others on nearby Wascana Lake, all having evidently arrived on the same night.) Their wet appearance, and busy preening, gave ample evidence of the wet feather condition. Far from content to rest after a presumably long migration flight, they were busy removing the water from their soaked plumage. They did this with stropping motions of their long bills, drawing the feathers of their belly and flanks, strip by strip, through the bill, thus squeezing out the excess water. When we approached them, the Western Grebes lurched to their feet and scrambled down the slope and into the water. They sailed out from shore, ruffling their feathers, and reared up to spread and shake their wings. They were clearly uneasy in the water and soon returned and shuffled out on to land again, in spite of the presence of our car parked *less* than 15 feet from the edge of the water. The sloped bank which they were using was, however, the most accessible place to leave the water.

The Eared Grebe appeared to be in the worst condition—wet and tired, it refused to enter the water; the Horned Grebe followed the Westerns into the water, but it clambered back out again almost at once. The big Westerns appeared to be wet mainly on the belly and flanks, but they too seemed anxious to get back on to land, even fighting their way past a few aggressive individuals in the flock that screeched and jabbed at them as they attempted to get by. I was surprised to see this much aggression, for Western Grebes usually seem fairly tolerant. Here, however, forced together on the sloped bank, they were in closer quarters than is probably ever the case under normal conditions.

Some 36 hours later, on the morning of May 10, we returned and found 14 of the Western Grebes, and the Horned and Eared Grebes, resting on shore in the same place, still as "wettable" as ever. Their sorry condition gave us an opportunity to study and to photograph them at close range. When we approached they rushed to the safety of the water, but again soon returned to land, even though the car was parked within five feet!

Once more we were struck by the apparent urgency with which they stropped the water out of their feathers as soon as they were out on land; a kind of desperate preening of their wet feathers was an almost constant activity. Though they were as handsome as ever, strikingly so in the bright light of morning and particularly against the green grass, their obvious plight gave them the appearance of trapped animals. In effect, they were trapped on land — a dangerous situation for waterbirds. Only a few yards away we found one dead Western Grebe which had been shot, evidently with a .22 rifle.

In mid-afternoon we returned and arranged to capture the grebes, using a piece of wire netting to fence them off from the pond. After setting this in position we withdrew to allow the grebes to return to land.

It was a perfectly calm day, bright and warm, and by the time that we had set the netting in position the grebes had scattered hundreds of yards away to the far corners of the lagoon. However, 10 of the 14 Westerns soon returned to the same familiar slope, walking over the wire netting without any apparent concern. The other four Western Grebes, which we presumed to be the more aggressive members of the flock, and perhaps the stronger ones, suddenly, and much to our amazement, took flight over the

Grebes resting on lagoon embankment.

Disturbed grebes ignore photographer.

Grebes of three species preening in the su lagoon! They had risen rapidly, circled the lagoon once while continuing to rise, then had headed straight east at a considerable height until out of sight; a most intriguing spectacle since one seldom sees grebes in flight.

This was perhaps our most significant observation of the season. Now we knew that even a fairly wet grebe could take flight and thus could leave the lagoon. Even after reaching clean, fresh water they would still be "wettable", would still want to get out onto land, and would thus be unusually vulnerable to predation. We also reasoned that if a wet grebe could take flight, then surely ducks, with a larger ratio of wing surface to body weight, could leave these lagoons with little effort. This left us wondering about the number of waterbirds which may suffer wetting on these lagoons but which simply fly away.

The 10 remaining Western Grebes were captured, measured, banded, and released into a natural marsh within the city limits—the Regina Waterfowl Park. One was found dead six days later on land in the Waterfowl Park; the eventual disappearance of Western Grebes from the Park suggests that the rest regained their powers of flight. One adult male, which we had released on May 9, survived to be found (by B. Daily, 903 Moose Jaw St., Penticton, B.C.) a year later in July 1965 at Whitehead Lake, British Columbia.

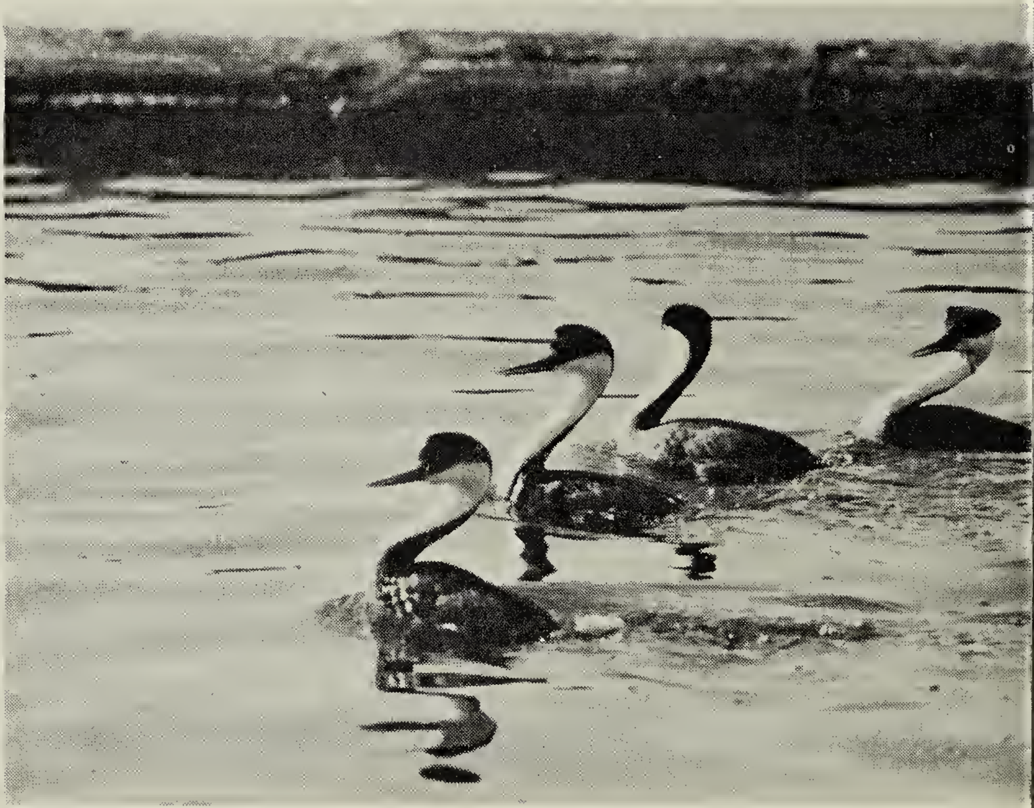
From May 11 to June 25 we observed or captured an additional 20 wet waterbirds, comprised of 5 Western Grebes, 3 Eared Grebes, 6 Pied-billed Grebes, 5 Ruddy Ducks, and 1 American Coot.

Waterbirds are notably waterproof, their short, dense and carefully arranged feathers being an effective means of repelling water. The layer of air trapped within their feathers aids them in maintaining buoyancy and also keeps them warm and dry, in or out of water, even in the coldest weather. In an article appropriately entitled "Why does a duck float?" (W. D. Schmid. 1963. *The Flicker* (now *The Loon*), 35:117-121), the author concludes that waterproofness of feathers is "entirely structural" and that the "secretion of the preen gland is important to the maintenance of the water repellent nature of the feathers by preserving their physical structure and does not seem to function as a waterproof coating." Birds with plumage fouled with waste oil may be saved by washing their feathers with a detergent, but this treatment also affects the waterproofing. Such birds become wet-feathered when placed in water, and a considerable period of time may elapse before the waterproof condition is restored (Katherine Tottenham. 1963. Bird doctor. Country Book Club, London). Horned Grebes kept in captivity by us took up to two weeks to regain their waterproofing (Nero, *op. cit.*).

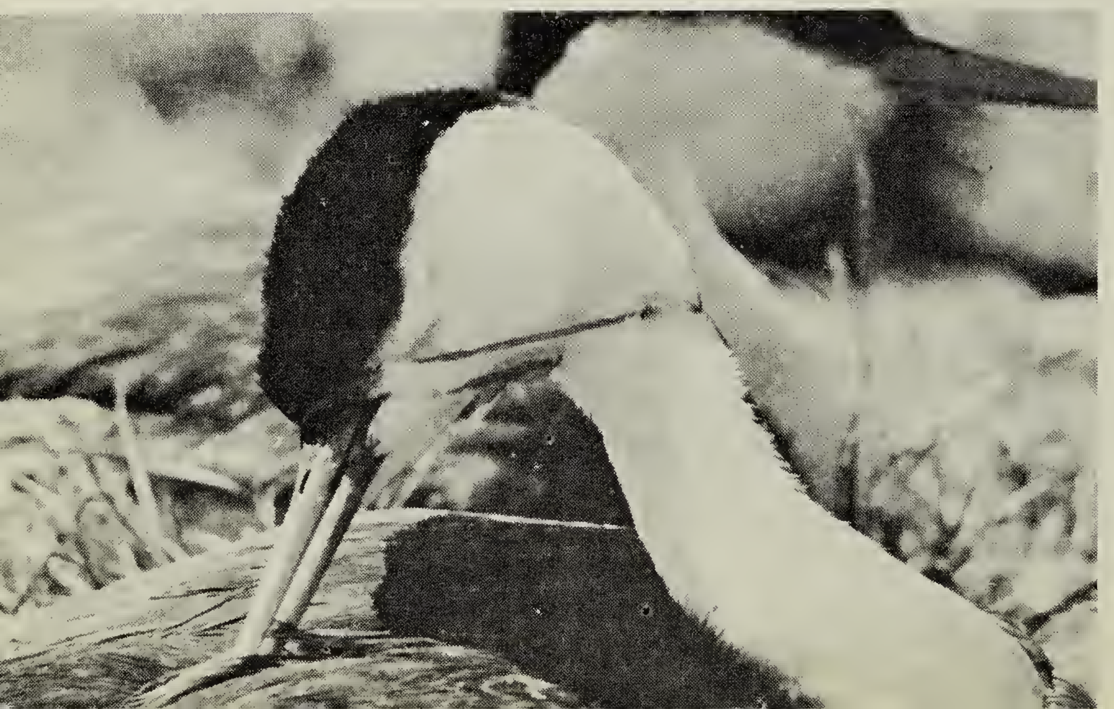
Our observations indicate that, whatever the cause, the waterproofing effect of feathers may be lost after only short contact with sewage waters. Admittedly, the chemical agents causing this effect are not known. On some of the days on which we found wet grebes the water in the lagoons appeared relatively clear, though on windy days a foam was always present. This, plus the enormous quantity of foam on the adjacent waters of Wascana Creek, into which water from the lagoons is discharged, led us to attribute the wetting effect to waste detergents, which are notable foam-causing agents. Detergent companies disagree, and there has been much concern expressed about conclusions in this respect.

In view of the increasing number of sewage lagoons and the attractiveness of some as breeding grounds for waterfowl (e.g. see: J. N. Dornbush and J. R. Anderson. 1964. Ducks on the wastewater pond. *Water and sewage works*, 3:271-276), the nature of the effect of waste synthetic detergents and other surface tension reducing pollutants upon the waterproofing mechanism of waterbirds deserves detailed study.

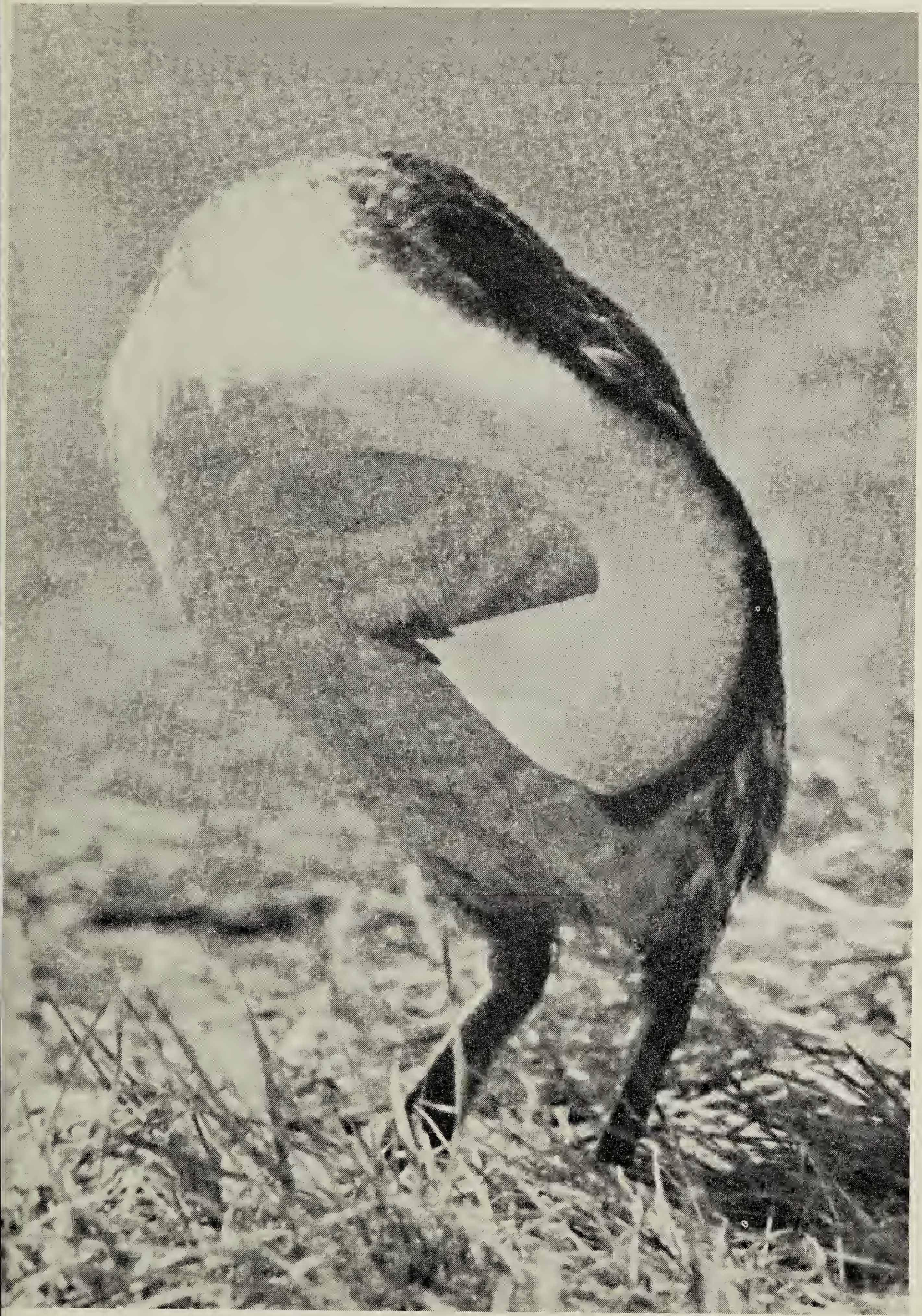
Note the relatively small wings.



Wet grebes, anxious to return to shore.



Another problem—bound in a rubber ring from lagoon debris.



Western Grebe standing upright, squeezing water from wet belly feathers.

TWENTY-SIXTH ANNUAL SASKATCHEWAN CHRISTMAS BIRD COUNT, 1967

Compiled by **Mary Houston,** 863 University Drive, Saskatoon

Christmas bird counts were taken in 25 areas in Saskatchewan in 1967, producing interesting results.

A Mockingbird, rare in the province at any time, was reported from Regina. At Val Marie, a Fox Sparrow was seen—not on count day, but during the count period. These two species will be added to the all-time list for Christmas bird counts in Saskatchewan and bring the total to 115 species.

Aside from the waterbirds (White Pelican, Mute and Whistling Swans, Canada Goose, Mallard, Gadwall, Pintail, Shoveler, Canvasback and Common Goldeneye) a large number of species we consider "summer birds" were counted. These included, as well as the Mockingbird and Fox Sparrow, such species as Yellow-shafted Flicker (seen in 5 areas), Robin (2 areas), Cedar Waxwing (2 areas) and Red-winged Blackbird, Common Grackle, Rusty Blackbird and Tree Sparrow (1 area each).

A total of 57 species was seen on count days with an additional five species seen during the count period.

Every one of the 25 areas reporting recorded Black-billed Magpies; 24 recorded House Sparrows; 20, Snow Buntings; and 19, Black-capped Chickadees.

Stan Riome of Nipawin coordinated a survey of the Nipawin area with the Nipawin-Squaw Rapids, Nipawin-White Fox and Codette regions being covered by separate groups. The seven Bald Eagles reported from the Nipawin-Squaw Rapids area were of particular interest.

Skull Creek counters, with Steve Mann as compiler, have a pleasant tradition of finishing off their count with dinner and an evening of comparing notes, at the home of one of the counters.

BROADVIEW, Dec. 26; 75 miles by car and 1 on foot in 6 hours; temp. –10°; wind NW 12 mph; 5 species, 84 individuals. Sharp - tailed grouse, 5; Black-billed Magpie, 53; Black-capped Chickadee, 5; Starling, 15; House Sparrow, 6.—D. G. Francis.

CODETTE, Dec. 31; temp. –30°; 21 species, 224 individuals. Goshawk, 1; Spruce Grouse, 2; Ruffed Grouse, 4; Sharp-tailed Grouse, 2; Gray Partridge, 18; Rock Dove, 4; Great Horned Owl, 1; Snowy Owl, 2; Boreal Owl, 1; Hairy Woodpecker, 1; Downy Woodpecker, 1; Blue Jay, 2; Black-billed Magpie, 6; Common Raven, 4; Black-capped Chickadee, 6; Bohemian Waxwing, 8; Starling, 12; House Sparrow, 28; Pine Grosbeak, 7; Common Redpoll, 14; Snow Bunting, 100.—W. Harstad.

CRAVEN, Dec. 23; 52 miles by car and 3 miles on foot in 4½ hours; temp. –5° to 5°; wind NW 20 mph; mostly overcast with occasional light snow; 2 inches of snow; 10 species, 517 individuals. Rough-legged Hawk, 1; Rock Dove, 12; Short-eared Owl, 1; Horned Lark, 45; Black-billed Magpie, 15; Black-capped Chickadee, 3; Bohemian Waxwing, 304; Starling, 2; House Sparrow, 74; Snow Bunting, 60. (Add: Ring-necked Pheasant, 1, Dec. 28; Northern Shrike, 1, Dec. 30; Evening Grosbeak, 12, Dec. 29).—Greg Bobbitt, Eric Cooke.

DILKE, Dec. 28; 70 miles by car and 2 on foot in 3½ hours; temp. 10° to 16°; wind SW at 25 mph shifting to NW at 25 mph; 6 inches of snow heavily drifted; 6 species, 289 individuals. Gray Partridge, 1; Horned Lark, 91; Black-billed Magpie, 27; Black-capped Chickadee, 1; Bohemian Waxwing, 144; House Sparrow, 25. (Add: Sharp-tailed Grouse, 1, Dec. 23; Snowy Owl, 2, Dec. 23 and 26).—Boswell Belcher (compiler), Margaret Belcher, Mr. and Mrs. S. R. Belcher.

FORT QU'APPELLE, Dec. 27; 13 species, 163 individuals. Sharp-tailed

Grouse, 6; Gray Partridge, 9; Rock Dove, 12; Downy Woodpecker, 1; Gray Jay, 1; Black-billed Magpie, 3; Black-capped Chickadee, 4; Robin, 1; Bohemian Waxwing, 6; House Sparrow, 18; Pine Grosbeak, 1; Slate-colored Junco, 1; Snow Bunting, 100. (Add: Ruffed Grouse, 1, Dec. 24 and 28; Great Horned Owl, 1, Dec. 23 and Dec. 26; Hairy Woodpecker, 2, Dec. 21; Blue Jay, 1, Dec. 22 and 4, Dec. 28; White-breasted Nuthatch, 1, Dec. 23; Northern Shrike, 1, Jan. 1).—Dr. G. D. Barnett, E. Manley Callin (compiler), Mr. and Mrs. Errol Cochrane, Mr. and Mrs. William Gray, Ron Hooper, Dick Nevard, Horace Reed, Sham Regan, Chad Sunley.

GIRVIN, Dec. 28; 6 species, 436 individuals. Golden Eagle, 1; Sharp-tailed Grouse, 7; Black-billed Magpie, 2; Starling, 1; House Sparrow, 250; Snow Bunting, 175. (Add: Gray Partridge, 9, Dec. 31; Snowy Owl, 1, Dec. 22; Horned Lark, 5 on Dec. 21, 25 on Dec. 22, 40 on Dec. 23, 125 on Dec. 25; Northern Shrike, 1, Dec. 22).—Fred Kochendorfer.

GRENFELL, Dec. 31; 6 miles by car and around the yard throughout the day; temp. –13°; wind SE 15 mph; 9 inches of snow; 4 species, 28 individuals. Sharp-tailed Grouse, 6; Black-billed Magpie, 2; House Sparrow, 100; Snow Bunting, 20. (Add: Ruffed Grouse, 2, Dec. 24; Great Horned Owl, 1, Jan. 1; Black-capped Chickadee, 1, Jan. 1).—Mr. and Mrs. John Hubbard.

HAWARDEN, Dec. 21; 20 miles by car and on foot; temp. 10°; 3 inches of snow; 3 species, 62 individuals. Horned Lark, 40; Black-billed Magpie, 2; House Sparrow, 20. (Add: Snowy Owl, 1, Dec. 25; Bohemian Waxwing, 40, Dec. 20; Snow Bunting, 1000, Dec. 27).—Harold Kvinge.

KENASTON, Dec. 28; by car, by horse and on foot covering thoroughly 480 acres; temp. –4° to 23°; heavily overcast; wind light, rising to 15 mph; 8 inches of snow; 9 species, 94 individuals. Sharp-tailed Grouse, 2; Gray Partridge, 30; Great Horned Owl, 1; Blue Jay, 3; Black-billed Magpie, 14; Black-capped Chickadee, 2; House Sparrow, 40; Slate-colored Junco, 1; Snow Bunting, 1. (Add: Golden Eagle, 1, Dec. 24; Rock Dove, 40; Horned Lark, 15 on Dec. 22 and 15 on Jan. 1.)—Lawrence Beckie.

LEADER, Dec. 27; 1 hour in the field; temp. 20°; clear and calm; 4 inches of snow; 5 species, 220 individuals. Sharp-tailed Grouse, 5; Ring-necked Pheasant, 2; Blue Jay, 3; Black-billed Magpie, 10; Bohemian Waxwing, 200. —Daisy D. Meyers.

MOOSE JAW, Dec. 26; 90 miles by car and 10 miles on foot; temp. –5° to –10°; wind 10 mph; sunny; 8 inches of snow; 11 species, 748 individuals. Ring-necked Pheasant, 10; Gray Partridge, 11; Rock Dove, 33; Yellow-shafted Flicker, 2; Black-billed Magpie, 27; Black-capped Chickadee, 19; Bohemian Waxwing, 302; Starling, 5; House Sparrow, 134; Pine Grosbeak, 42; Snow Bunting, 163. (Add: Hairy Woodpecker, 2, Dec. 27; Downy Woodpecker, 2, Dec. 27; Northern Shrike, 1, Dec. 21).—Bev. Brander, Mrs. A. Davis, Carl Ellis, Pat Kern, Mr. and Mrs. Cy Knight, Walter Riome, M. Ritchie, Mr. and Mrs. Gordon Silversides, Ruth and Bob Tobaka, Mrs. Waterson, Lee Woodley. (Members of the Moose Jaw Natural History Society. Leith Knight, compiler.)

NIPAWIN-SQUAW RAPIDS, Dec. 26; all day; temp. –10°; wind NW 10 mph; 23 species, 429 individuals. Common Goldeneye, 21; Goshawk, 1; Golden Eagle, 1; Bald Eagle, 7; Rock Dove, 22; Snowy Owl, 3; Hairy Woodpecker, 4; Downy Woodpecker, 1; Gray Jay, 3; Blue Jay, 4; Black-billed Magpie, 27; Common Raven, 12; Black-capped Chickadee, 9; Boreal Chickadee, 5; Red-breasted Nuthatch, 1; Northern Shrike, 1; Starling, 12; House Sparrow, 60; Evening Grosbeak, 50; Pine Grosbeak, 4; Hoary Redpoll, 1; Common Redpoll, 30; Snow Bunting, 150. — David Riome, Stan Riome.

NIPAWIN - WHITE FOX, Dec. 31; temp. –30°; 12 species, 67 individuals. Sharp-tailed Grouse, 12; Gray Partridge, 3; Hairy Woodpecker, 2; Downy Woodpecker, 1; Gray Jay, 3; Blue Jay, 1; Black-billed Magpie, 2;

Common Raven, 13; Black-capped Chickadee, 3; House Sparrow, 2; Pine Grosbeak, 3; Snow Bunting, 22.—Anne Matthew, Walter Matthews, Wm. Matthews.

NOKOMIS, Dec. 26; 40 miles by car; 2½ hours; temp. –5°; sunny; light wind; 4 species, 487 individuals. Rock Dove, 10; Black-billed Magpie, 7; House Sparrow, 20; Snow Bunting, 450.—J. W. Hamilton and son.

RAYMORE, Dec. 27; 10 miles on foot and 15 miles by car; temp. –5°; wind light; overcast; 16 species, 249 individuals. Ruffed Grouse, 11; Sharp-tailed Grouse, 12; Rock Dove, 20; Great Horned Owl, 4; Hairy Woodpecker, 3; Downy Woodpecker, 4; Gray Jay, 1; Black-billed Magpie, 5; Common Crow, 1; Black-capped Chickadee, 7; Brown Creeper, 1; Bohemian Waxwing, 3; House Sparrow, 30; Pine Grosbeak, 17; Common Redpoll, 20; Snow Bunting, 100. (Add: Gray Partridge, 30, Dec. 22; Northern Shrike, 1, Jan. 1; Evening Grosbeak, 1, Dec. 25; White-winged Crossbill, 1, Dec. 29).—Wayne Harris.

REGINA, Dec. 26; 197 miles by car in 25 party hours, and 59 miles on foot in 10 party hours; temp. –10° to –4°; wind NW 15 mph; fog patches in A.M., clear in P.M. and mist over Waterfowl Park; 6 inches of snow; 36 species, 4775 individuals. White Pelican, 1; Mute Swan, 3; Whistling Swan, 5; Canada Goose, 300; Mallard, 525; Gadwall, 1; Canvasback, 2; Common Goldeneye, 7; Ruffed Grouse, 1; Sharp-tailed Grouse, 11; Gray Partridge, 35; Coot, 1; Rock Dove, 144; Great Horned Owl, 3; Snowy Owl, 8; Saw-whet Owl, 1; Yellow-shafted Flicker, 6; Hairy Woodpecker, 4; Downy Woodpecker, 6; Horned Lark, 13; Black-billed Magpie, 51; Common Crow, 1; Black-capped Chickadee, 24; Brown Creeper, 1; Mockingbird, 1; Robin, 3; Bohemian Waxwing, 1107; Cedar Waxwing, 1; Northern Shrike, 2; Starling, 16; House Sparrow, 2413; Red-winged Blackbird, 1; Common Grackle, 3; Pine Grosbeak, 24; Common Redpoll, 44; Snow Bunting, 6. (Add: Pintail, 1, Dec. 23; Rusty Blackbird, 1, Dec. 21; Evening Grosbeak, 1, Dec. 24).—Marc Abrioux, Gary Anweiler, Ron Austin, Mrs. J. Bailey, Margaret Belcher, Al Binnie, Carole Binnie, Greg Bobbitt, Frank Brazier, Bill Brownlee, Eric Cooke, Doug Gilroy, Jay Jordan, Jim Jowsey, Harriet Jowsey, George Ledingham, Christine MacDonald, Helen Morrison, Sally Moss, Eric Olesen, Maureen Rever, Joe Roberts, Hugh Smith, Elisabeth Wagner, Holly Wallace. (Al and Betty Binnie, compilers).

SALTCOATS, Dec. 30; 3 miles on foot and 12 by car—from dawn to dusk; temp. –25°; wind NW 10 mph; mostly clear; 9 species, 181 individuals. Ruffed Grouse, 1; Sharp-tailed Grouse, 10; Gray Partridge, 6; Downy Woodpecker, 2; Black-billed Magpie, 5; Common Raven, 2; Black-capped Chickadee, 5; House Sparrow, 22; Snow Bunting, 128.—Harold Jowsey, J. Norman Jowsey, J. R. Jowsey (compiler), Eric Upshall.

SASKATOON, Dec. 26; 19 party hours and 27 party miles on foot, 28 party hours and 239 party miles by car; temp. –19° to –8°; wind NW 7 to 14 mph; clear; 6 inches of snow; 23 species, 7863 individuals. Mallard, 22; Shoveler, 1; Ruffed Grouse, 4; Sharp-tailed Grouse, 58; Ring-necked Pheasant, 11; Gray Partridge, 269; Rock Dove, 630; Great Horned Owl, 2; Snowy Owl, 3; Hairy Woodpecker, 2; Downy Woodpecker, 4; Horned Lark, 100; Blue Jay, 21; Black-billed Magpie, 171; Black-capped Chickadee, 41; Bohemian Waxwing, 4299; Cedar Waxwing, 15; Northern Shrike, 2; Starling, 4; House Sparrow, 2010; Pine Grosbeak, 141; Common Redpoll, 22; Snow Bunting, 31. (Add: Common Goldeneye, 1, Dec. 25; Yellow-shafted Flicker, 1, Dec. 24; Brown Creeper, 1, Dec. 23; Evening Grosbeak, Dec. 30). Harold Belcher, Dr. Bruce Brandell, W. J. Brucks, John Cartwright, C. Chamberlin, Pern Cordery, Marie Gillespie, Dr. and Mrs. J. B. Gollop, Vi Harper, Mr. and Mrs. J. D. Hogg, David Houston, Dr. C. J. Houston, Dr. Stuart Houston (compiler), Anna Miller, Arnold Nijssen, Joe Schmidt, John and Stan Shadick, Alan Smith, Fred Waite, J. A. Wedgwood.

SKULL CREEK, Dec. 29; 42 party miles on foot, 6 by car and 15 by tractor in 2½ hours; temp. 10° to 0°; light wind; 20 species, 957 individuals. Golden Eagle, 3; Sharp-tailed Grouse, 124; Ring-necked Pheasant, 9; Gray Partridge, 52; Great Horned Owl, 5; Snowy Owl, 1; Saw-whet Owl, 1; Yellow-shafted Flicker, 1; Hairy Woodpecker, 8; Downy Woodpecker, 7; Horned Lark, 22; Blue Jay, 1; Black-billed Magpie, 130; Black-capped Chickadee, 34; Bohemian Waxwing, 310; Northern Shrike, 1; House Sparrow, 96; Pine Grosbeak, 58; Common Redpoll, 20; Snow Bunting, 74. (Add: Bald Eagle, 2, Dec. 24).—Stan Birchall, Henry, Edith and Doug Borman, Austin Drever, Dorothy Eccleston, Phyllis Flagg and Randy and Leslie Flagg, Robert, Patti, Jimmie, and Dougie Mann, Steve Mann (compiler), Peter Swain.

SPIRIT LAKE, Dec. 24; 5 party hours and 5 party miles, and about yards; temp. 9°; clear, windy with drifting snow; 8 inches of snow; 13 species, 113 individuals. Ruffed Grouse, 2; Pileated Woodpecker, 1; Hairy Woodpecker, 8; Downy Woodpecker, 8; Gray Jay, 2; Black-billed Magpie, 3; Black-capped Chickadee, 45; White-breasted Nuthatch, 2; Northern Shrike, 1; House Sparrow, 25; Evening Grosbeak, 2; Pine Grosbeak, 2; Snow Bunting, 12. (Add: Sharp-tailed Grouse, 1, Jan. 1; Great Horned Owl, 1, Dec. 20 and 27). —Iris Anaka, Bill Anaka, Mrs. J. Gunn, Joyce Gunn (compiler).

SWIFT CURRENT, Dec. 29; 5 hours; temp. 20°; wind light; 8 species, 3111 individuals. Sharp-tailed Grouse, 2; Ring-necked Pheasant, 1; Gray Partridge, 27; Horned Lark, 18; Black-billed Magpie, 10; Bohemian Waxwing, 36; Starling, 17; House Sparrow, 3,000.—Mrs. B. Hare, Mrs. J. McDaid.

VAL MARIE, Dec. 25; 60 miles by car, 4 miles on foot; temp. 20° to 0°; cloudy, clearing later; 2 inches of snow; 12 species, 1916 individuals. Golden Eagle, 3; Sharp-tailed Grouse, 2; Sage Grouse, 1; Ring-necked Pheasant, 12; Long-eared Owl, 1; Flicker, 1; Horned Lark, 170; Black-billed Magpie, 21; Black-capped Chickadee, 3; House Sparrow, 1; Pine Grosbeak, 1; Snow Bunting, 1700. (Add: Gray Partridge, 9; Bohemian Waxwing, 1; Northern Shrike, 1; Starling, 2; Tree Sparrow, 10; Fox Sparrow, 1, all on Dec. 22).—J. David Chandler, Ruth Chandler.

WOLSELEY, Jan. 1; 20 miles by car and around farmyard; temp. -22°; wind light; 10 species, 319 individuals. Ruffed Grouse, 1; Gray Partridge, 25; Rock Dove, 24; Great Horned Owl, 1; Hairy Woodpecker, 2; Horned Lark, 10; Black-billed Magpie, 3; Black-capped Chickadee, 3; House Sparrow, 50; Snow Bunting, 200. (Add: Snowy Owl, 1, Dec. 23; Northern Shrike, 1). —J. Donald Hayward.

YELLOW CREEK, Dec. 31; 4 miles on foot for 3 hours; temp. -15°; wind E 15 mph; overcast with light snow; 17 inches of snow; 7 species, 88 individuals. Hairy Woodpecker, 1; Black-billed Magpie, 6; Common Raven, 1; Black-capped Chickadee, 13; House Sparrow, 64; Evening Grosbeak, 2; Snow Bunting, 1. (Add: Ruffed Grouse, 4, Jan. 1; Great Horned Owl, 1, Dec. 20; Downy Woodpecker, 1, Dec. 25).—Bohdan Pylypec.

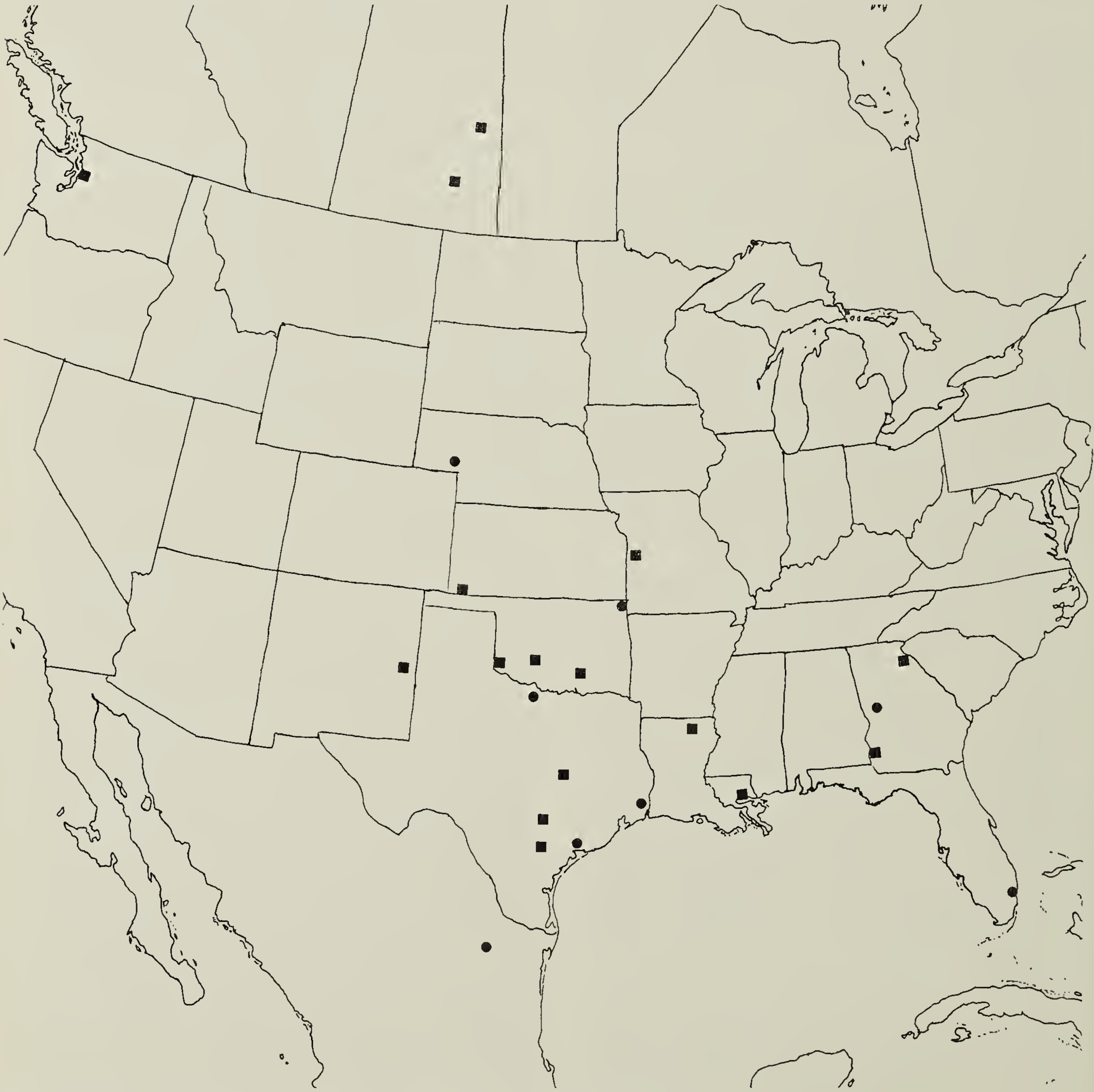
YORKTON, Dec. 26; 155 party miles by car and 18½ party miles on foot; temp. -15° to -3°; wind WNW 15 mph. in P.M.; 10 inches of snow; 16 species, 305 individuals. Ruffed Grouse, 1; Sharp-tailed Grouse, 24; Gray Partridge 12; Rock Dove, 2; Great Horned Owl, 1; Snowy Owl, 2; Hairy Woodpecker, 7; Downy Woodpecker, 1; Blue Jay, 3; Black-billed Magpie, 23; Black-capped Chickadee, 12; Bohemian Waxwing, 18; House Sparrow, 106; Pine Grosbeak, 1; Common Redpoll, 12; Snow Bunting, 80.—Bob Pearce, Gordon Pearce, Irving Pearce, Larry Morgotch, Frank Switzer, Harold Wilkinson (Yorkton Natural History Society—senior branch). Rod and Michael Bantjes, Bruce Eckhart, Kerry Koch, Keith and Denyse Monette (Yorkton Natural History Society—junior branch).

RECOVERIES OF MARSH HAWKS BANDED IN SASKATCHEWAN

From files of Canadian Wildlife Service

Notes and map by **C. Stuart Houston,** 863 University Drive, Saskatoon

These 24 recoveries indicate a wider dispersal for Marsh Hawks than for the Red-tailed Hawk and Black-crowned Night Heron already mapped. A Regina Marsh Hawk went to the state of Washington and a Battleford bird to New Mexico. Recoveries from Georgia and Florida were banded in the eastern part of Saskatchewan. Although the sample is small, one wonders at the absence of recoveries from the middle northern states; is there less shooting there or do Marsh Hawks pass through quickly? Two-thirds of the recoveries were direct—16 within the year of banding, and the



Recoveries of Marsh Hawks banded in Saskatchewan.

Note: Squares represent direct recoveries (same year). Circles represent subsequent years.

oldest bird was less than six and one-half years of age when caught in a trap.

Recovery percentages varied widely. R. H. Carter, Jr. had only one recovery from 24 birds banded (under 3%) and this writer had only two from 82 banded up until the end of 1966 (just over 2%). On the other hand, the Wotherspoon brothers at Hyas had a phenomenal eight recoveries from 18 banded (44%), with half of them from Texas.

Banded by R. H. Carter, Jr., Muscow, Sask. (504-1035) (24 banded):
June 23/29. Shot Dec. 6/29 (direct) Kennedy, Texas (284-0975).

Banded by J. R. Carter, Muscow, Sask. (504-1035) (3 banded):
June 23/29. Captured Sept. 6/29 (direct) Rolla, Kansas (370-1013).
Aug. 8/29. Flew into wire Sept. 11/29 (direct) Ft. Qu'Appelle, Sask. (504-1035).

Banded by Fred G. Bard (504 to 512-1021 to 1052):
June 28/32. Shot Oct. 13/32 (direct) in Oklahoma (345-0982).
June 29/34. Shot Aug. 26/34 (direct) in Washington (475-1222).
July 3/38. Caught in trap before Dec. 6/44 (6 yr.) in Texas (334-0982).

Banded by Bill and Lindsay Wotherspoon, Hyas, Sask. (516-1021) (18 banded):
July 9/33. Shot Dec. 26/33 (direct) Archie, Missouri (383-0942).
July 9/33. Shot Nov. 11/33 (direct) Wynnewood, Okla. (348-0968).
July 29/33. Shot Dec. 20/34 (1 yr.) Beaumont, Texas (300-0940).
July 29/33. Shot Nov. 24/33 (direct) New Orleans, La. (295-0900).
July 29/33. Shot Oct. 21/35 (2 yr.) Edna, Texas (285-0963).
July 1/34. Shot Nov. 15/34 (direct) Temple, Texas (310-0970).
April 25/36. Shot Feb. 6/37 (–1 yr.) Davie, Florida (260-0801).
July 16/44. Shot Oct. 1/44 (direct) in Texas (293-0975).

Banded by F. J. Hartley Fredeen, Macrorie, Sask. (511-1070):
July 8/41. Shot Dec./41 (direct) in Oklahoma (344-0995).
July 8/41. Found dead before Jan. 6/44 (–3 yr.) Nebraska (412-1022).

Banded by Dick Bird, Regina Beach, Sask. (504-1045):
July 10/45. Shot Feb. 10/46 (–1 yr.) in Neuvo Leon, Mexico.

Banded by C. Stuart Houston, Yorkton, Sask. (510-1020 and 512-1015):
June 30/59. Shot before Nov. 13/59 (direct) Monroe, La. (323-0920).
July 17/60. Shot Sept. 21/60 (direct) Martin, Georgia (342-0831).

Banded by Glen A. Fox, Battleford, Sask. (524-1081):
July 9/60. Injured Sept. 1/60 (direct) in New Mexico (342-1033).
July 1/61. Found dead Jan. 22/62 (–1 yr.) in Oklahoma (365-0944).

Banded by Wm. Anaka, Spirit Lake, Sask. (513-1023):
July 18/61. Shot Nov. 30/61 (direct) in Georgia (312-0845).
July 18/61. Shot Nov. 22/62 (1 yr.) in Georgia (325-0843).

Banded by Walter and Billy Matthews, Nipawin, Sask. (532-1040):
June 30/51. Shot Sept. 15/51 (direct) Somme, Sask. (523-1025).

Note: 513-1023 means 51°30′ North and 102°30′ West.

MIGRANT STARLING

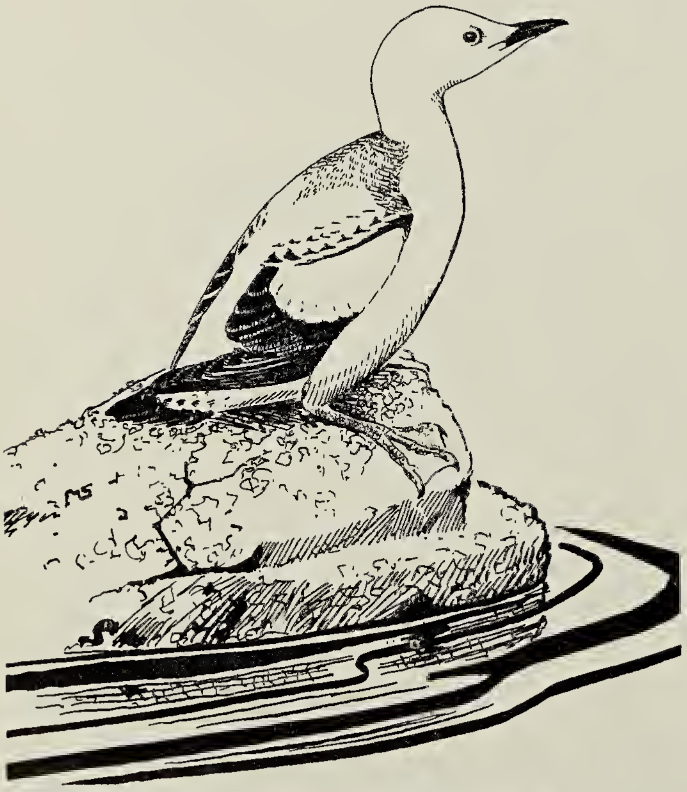
by **Sig Jordheim**, White Bear

On June 16, 1967 my children found a starling caught by one toe in a nest hole at a shed. They noticed a band on its leg, but being unable to get at the captive toe, they notified me and I helped them free the bird and get its number. This I sent to the U.S. Fish and Wildlife Service, and the Service has just notified me that the bird was banded at Los Banos, California on January 12, 1962.

MANITOBA BLACK GUILLEMOT SPECIMEN

by **Robert W. Nero,** Manitoba Museum of Man and Nature
147 James Ave., Winnipeg 2, Manitoba

An adult bird in winter plumage found dead on November 12, 1966 on the bank of the Red River at Morris, 33 miles south of Winnipeg, comprises the first specimen of the Black Guillemot *(Cepphus grylle)* for Manitoba. Identification of the specimen was confirmed by W. Earl Godfrey, National Museum of Canada, who determined it to be *C. g. ultimus*, the expected subspecies for the Hudson Bay area (pers. corres., December 8, 1967). For this interesting record we are indebted to Mr. Michael Dixon of Morris, who discovered the dead bird, and Charles Dixon, Wildlife Branch, Manitoba Department of Mines and Natural Resources, who brought the refrigerated bird to the museum on April 20, 1967. Judging by the condition of the soft parts of the bird it had been found probably shortly after death. Although the stomach contents were nil there was still some fat on the major feather tracts, which suggests that the bird perished from exhaustion rather than starvation. The specimen is of undetermined sex (MMMN 1.2-2447).



Black Guillemot, winter plumage, Morris, Manitoba, November 12, 1966

Godfrey (1966) describes the Black Guillemot as a "teal-sized sea-diver with slender pointed bill and large white wing patch"; in the breeding plumage it is black all over, with the exception of the wing patch. The specimen from Morris is nearly all white, with black wings and tail and some dark flecking on the upper back (see figure). Godfrey notes that this species breeds in eastern arctic Canada, south along the east side of Hudson Bay to James Bay, but is not generally found along the west side of Hudson Bay. It winters in open waters off the breeding grounds, including Hudson Bay.

The present specimen record is of special interest inasmuch as the Black Guillemot seldom strays inland. Godfrey *(op. cit.)* lists it as accidental in Canada only for southern Ontario ("Toronto; sight record for Kingston"); the A.O.U. Check-list (1957) records it as accidental only in eastern Pennsylvania; there seem to be no other inland records. In contrast, some other sea birds of the family Alcidae are frequently found inland. The Ancient Murrelet *(Synthliboramphus antiquus)*, for example, has been reported from at least 27 localities in the United States and Canada (Munyer, 1965), although its breeding range is limited to coastal islands of the North Pacific (Godfrey, *op. cit.*). Munyer relates these records, of which two-thirds are dated November or late October, to weather disturbances over the Pacific coast. A Manitoba Ancient Murrelet specimen, with an unusually early fall date, was unfortunately overlooked by Munyer: one was found alive on a Winnipeg street on October 8, 1953 (MMMN 1.2-2252).

Weather records for the week preceding the occurrence of the Black

Guillemot specimen at Morris indicate that subsequent to November 8 there were no conditions which could be assumed to have caused a southwestward flight from Hudson Bay to southern Manitoba. Between November 5 and 8, however, an intense storm moving north along the east side of Hudson Bay caused a strong southwestwardly flow of moist air over the bay. On November 5, winds up to 35 mph from the north were recorded at Hudson Bay. On the previous day, winds in the same area were northeast up to 35 mph. In southern Manitoba in early November freeze-up is still not complete. The large lakes of central Manitoba — Lakes Winnipeg, and Winnipegosis — still have extensive ice-free areas, as do the major rivers of the eastern part of the province.

Preble's sight record of a Black Guillemot (earlier known as Mandt or Mandt's Guillemot) on Button Bay at Churchill on August 19, 1900 (1902: 77) is apparently the first record of this species for Manitoba. At Churchill, Taverner and Sutton (1934: 59) recorded five seen off Eskimo Point on August 6, 1930, and one seen on July 15, 1933. Ornithologists working recently at Churchill observed this species on two occasions in the same year as that of the present specimen: John Lamey recorded a flock of 12 seen on June 28, 1966 off Cape Merry (pers. corres. January 24, 1967); Joseph R. Jehl, Jr., reports seeing one flying along the coast at Churchill on July 22, 1966 (pers. corres., December 29, 1967). Jehl notes that the timing of the several Churchill records suggests that the birds were postbreeding.

There seem to be no other valid records for Manitoba. Thompson (1891:468) only guessed that they might occur here, stating: "Recorded by Andrew Murray, from Severn House [Ontario], and therefore probably Manitoban." The Manitoba Museum has records of two mounted specimens said to have been taken in 1916 in Albany (Ontario) or at Churchill. In the absence of more precise information these are hardly acceptable as evidence. No Manitoba records are given by Manning (1952), the A.O.U. Check-list (1957), or Godfrey (1966). The status of the Black Guillemot in Manitoba is thus accidental inland though it is a casual visitant in late summer along the northern seacoast.

I am grateful to Harold Hosford and Richard Sutton for assistance in the preparation of this report.

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RECORDS OF INDIGO BUNTING WANTED

Martin McNicholl is preparing a report on the status of the Indigo Bunting in Saskatchewan and Manitoba, and would appreciate receiving records of its occurrence in this area. Please send records to

Martin McNicholl
1281 Valour Road, Winnipeg, Man.

CO-OPERATIVE SPRING MIGRATION STUDY

Records are again requested for the continent - wide survey being made under the auspices of the U.S. Fish and Wildlife Service. As soon as it is available, the list of species for which reports are wanted can be obtained from **Mrs. Mary Houston.** Please submit your records to her by June 15, 1968 at 863 University Drive, Saskatoon.

AUTUMN RECORDS OF PARASITIC JAEGERS IN CENTRAL ALBERTA

by Dick Dekker, 3819 - 112A Street, Edmonton

At Beaverhill Lake, 40 miles east of Edmonton, Alberta, during the late summer and early fall of 1964, 1966, and 1967, I made 32 observations of jaegers. Nearly all these birds flew close to the shore of the lake and showed little or no fear of humans, hence it was often possible to identify them with certainty as Parasitic Jaegers *(Stercorarius parasiticus)*. Except for one bird whose tail feathers were evidently broken off (September 21), their elongated central tail feathers were pointed and about two inches long. All identified birds were adults of the light phase, and often a partial breast band was noticeable.

Jaegars were seen on two of five observation days in 1964; on none of five days in 1965; on one of 12 days in 1966; and on nine of 20 days in 1967. In 1964, doubles were seen twice on August 29; single birds were seen twice, and a couple, on September 20. In 1966, one was seen on September 27. In 1967, one was seen on August 27; a double on September 8; a single, a double, and four at once, on September 9; one on September 12; singles three times on September 13; singles twice on September 16; singles three times on September 21; one on September 30; and singles three times on October 8.

In 1967 especially, jaegers appeared to be of regular occurrence. As the weather was exceptionally fine during August and September several birds may have stayed in the area for a period of time, causing duplication of observations. On the other hand, seven birds seen on September 9 were believed to be different individuals: a single bird, and later a pair, were observed hunting along the shore; a group of four was leisurely soaring and moving away from the lake in a southerly direction.

By far the most interesting observations were those of their powers of flight. A jaeger can fly as leisurely as a gull, but when his predatory instincts are aroused, his wingbeats become as fast and vigorous as a falcon's. Waders and waterfowl react to his appearance as they do to a hunting peregrine: waders go up in tight flocks; ducks choose the safety of the water; coots and the smaller ducks dive with a splash when they find themselves directly in the line of flight of an approaching jaeger, skimming the lake's surface.

At one time a jaeger made a pass at an immature Herring Gull, but the latter turned around and chased the jaeger. The smaller gulls, such as Ring-billed and Bonaparte's, however, appear terrified when a jaeger singles them out. Apparently they sense it from a distance. Ring-billed Gulls did not even attempt to escape, but were seen to fly around erratically, screaming. Ofter the jaeger harassed a gull in vain; at any rate no disgorging of food was noticed. However, the last jaeger seen (October 8, 1967), which pursued a gull close to the observer, was rewarded with a shower of food particles. The jaeger dived and picked up the biggest chunk in mid-air. Once two jaegers were battling a Ring-billed Gull when one of the two apparently got so excited that he grabbed the gull twice. The second time both jaeger and gull fell into the water, where they separated. Jaegers also chase birds other than gulls. Sitting behind the observation blind of the Edmonton Bird Club on the south shore of Beaverhill Lake, Ludo Bogaert and the author saw a jaeger pursue a Marbled Godwit, which used the blind as a cover to escape. It shot past at arm's length, while the jaeger passed overhead in a rush of wings.

Some jaegers seem to specialize in the hunting of small waders. They give chase with apparent intent to kill. This was observed on several occasions. Always the jaegers hunted in pairs, flying low at terrific speed. Waders rose in front of them, and one of the little birds was singled out and pursued by both jaegers. Often it was so hard pressed that it was forced to take cover. One was seen to describe a great circle over the lake and finally plunge into a stand of reeds. The jaegers did not pause for a second but immediately climbed at a great pace towards a group of high-flying waders. They concentrated their efforts on a bird that left the group and made for the reeds. It lost altitude rapidly, but before it reached cover pursued and pursuer became one. The distance was too great to see clearly what took place, but it appeared that the sandpiper was caught. While its mate stayed in the air, the lucky jaeger perched on the ground for a minute, long enough to take care of its prize, which likely was swallowed whole.

To see the two dark-winged, white-bellied birds race low over the mudflats and the water, is an exciting spectacle. They surely are faster than the merlin, and possibly also swifter than the peregrine. In hunting so adroit a flyer as a sandpiper they have a great advantage over the falcons. Instead of stooping at their prospective prey and often overshooting the mark, they are able to follow all its movements. However, as is the case with both merlin and peregrine, by far the greater number of birds chased finally escape, either because the wader makes a smart move and outdistances its pursuer, or because the latter simply gives up and goes looking for an easier target.

In spite of many days of watching in April and May, when countless waders make a stop-over at Beaverhill Lake on their way north, no jaegers have been sighted there during that time. Fall migration through Alberta seems to be fairly regular, however, and may cover a wide front. During September of 1960 I saw a jaeger near Morley, in the foothills west of Calgary.

FIRST RECORD OF RUFF FOR ALBERTA

by **Bruce Jones** and **M. T. Myres**
Museum of Zoology, Department of Biology, University of Calgary

On May 15, 1967, B. Jones observed four birds that he was at first unable to identify. They were swimming on a slough two miles southeast of Janet, Alberta (50°58′30″N, 113°50′30″ W), about 10 miles east of Calgary. He collected one. Only then did he realize that he had seen four Ruffs *(Philomachus pugnax)*, or more properly two Ruffs and two Reeves.

The bird collected was a male with testis measurement 7x13mm. indicating a trend to breeding condition. The plumage approximates most closely the type B_2 described by Witherby *et al* (1940). The occipital tufts are black with a purple gloss. The pectoral ruff is white with some grey spots. The underparts are white. The back is pale buff and grey-brown with many feathers having a purple gloss. The skin is No. 145 in the Museum of Zoology of the Department of Biology, University of Calgary.

The four birds seen exhibited somewhat unusual behaviour in that they were *swimming* on the surface of a slough that was between eight inches and two feet deep at that point, some 15 yards from the shore. They swam in an area of approximately 40 square feet, picking at the surface and occasionally dipping their heads beneath it. During 10 minutes of observation the two males twice suddenly chased each other vigorously in a circle around a fence-post standing in the water. While doing so they displayed their ruffs and quivered their wings for a few seconds. After each occa-

Male Ruff collected May 15, 1967, at Janet, Alberta by Bruce Jones.

sion they resumed feeding.

Prof. W. Ray Salt of the University of Alberta, Edmonton, has confirmed that this is the first record of this species for Alberta.

It is also only the second occasion that Ruffs have been observed in western Canada. On May 8, 1965 one was collected near Regina, Saskatchewan, about 470 miles east of Calgary (Brazier, 1965).

Outside of Alaska, the only records from the western United States are from California, one on March 30, 1962, two in the month of September and one in December (McCaskie 1963). All other records are from the eastern half of the continent: Ontario, Quebec, New Brunswick, Nova Scotia, Minnesota, Wisconsin, Indiana, Ohio, Iowa, New York, Pennsylvania, and the east coast. Peakall (1965) has tabulated the month of observation of nearly 100 Ruff occurrences between 1953 and 1963 (in 1963 alone there were 30 reports). The most frequent months of occurrence are July and August, but there is a smaller spring peak that occurs in May. Peakall suggests that the Ruff may be breeding in North America.

It is interesting to speculate why four Ruffs were seen in Alberta in May, 1967. First, there were two pairs which suggests that they were *not* accidental vagrants far from home. Second, it is rather remarkable in view of the greater frequency of fall than spring records in North America) that the Saskatchewan record is a May record (Brazier, *op. cit.*) and that the Minnesota and Wisconsin records (Robbins, 1959; Strubble, 1964) are also May records. None of the westernmost records, therefore, are from the fall except for three from California, the fourth California record being from March.

The Ruff is a Eurasian shorebird. It has been assumed previously that birds observed in eastern North America have crossed the Atlantic from West Africa to South America but, as Peakall (1965) points out, this would result in more spring than fall observations whereas the reverse is the case. The larger number of fall records is suggestive of small numbers breeding somewhere on the North American continent. Since the fall records are mainly from the eastern states, and the birds are assumed to winter in South America, this would suggest that the North American breeding stock breeds in eastern or central Canada. The May records from Wisconsin, Minnesota, Saskatchewan and Alberta might suggest migrants moving north towards their breeding grounds somewhere in north-central Canada. On the other hand, these may have been displaced migrants from eastern Canada.

Ruffs breed in eastern Siberia, and

there are several records from Alaska, particularly from St. Lawrence Island in the month of May. This suggested to Gabrielson and Lincoln (1959) that there might be a small breeding population in Alaska. If that were so, the Californian records would be relatively easy to explain, but the east coast records would not be easy to explain unless the species migrated from west to east right across the Continent in the fall, which is not impossible but also not very likely, from *southern* Alaska.

An examination of the weather maps prior to the Alberta records of May 15, 1967 proves interesting. On May 10 a cold front associated with a depression swept across Alaska. Next day the cold front was moving southeastwards (Fig. 1). On May 13 it was in the southern Yukon, on May 14 (Fig. 2) it passed over northern B.C. and the edge of north Alberta, and on May 15 (Fig. 3) it passed over southern Alberta. It is possible that some Ruffs were carried southeast from Alaska into Alberta, and that they were resting there prior to moving with prevailing winds when seen on May 15. Alternately, the birds may have originated farther south and may have been moving north when grounded, but if so, they would probably already have resumed their journey before May 15.

If we then examine two other May records, those of May 8, 1965 in Saskatchewan and May 23, 1964 in Minnesota, we find that the preceding weather patterns are remarkably similar, differing only in that the warm front occluded the southeastward-moving cold front over a different region in each case — the region where the Ruff record was made.

These three observations tend to suggest that Ruffs reaching the Alaskan breeding grounds from Asia sometimes overshoot them into central Canada and the northern United States when carried by depressions moving eastwards from the Bering Sea. An alternative, but less satisfactory, explanation is that the Alaskan, and even some eastern Siberian, breeding birds migrate down the west

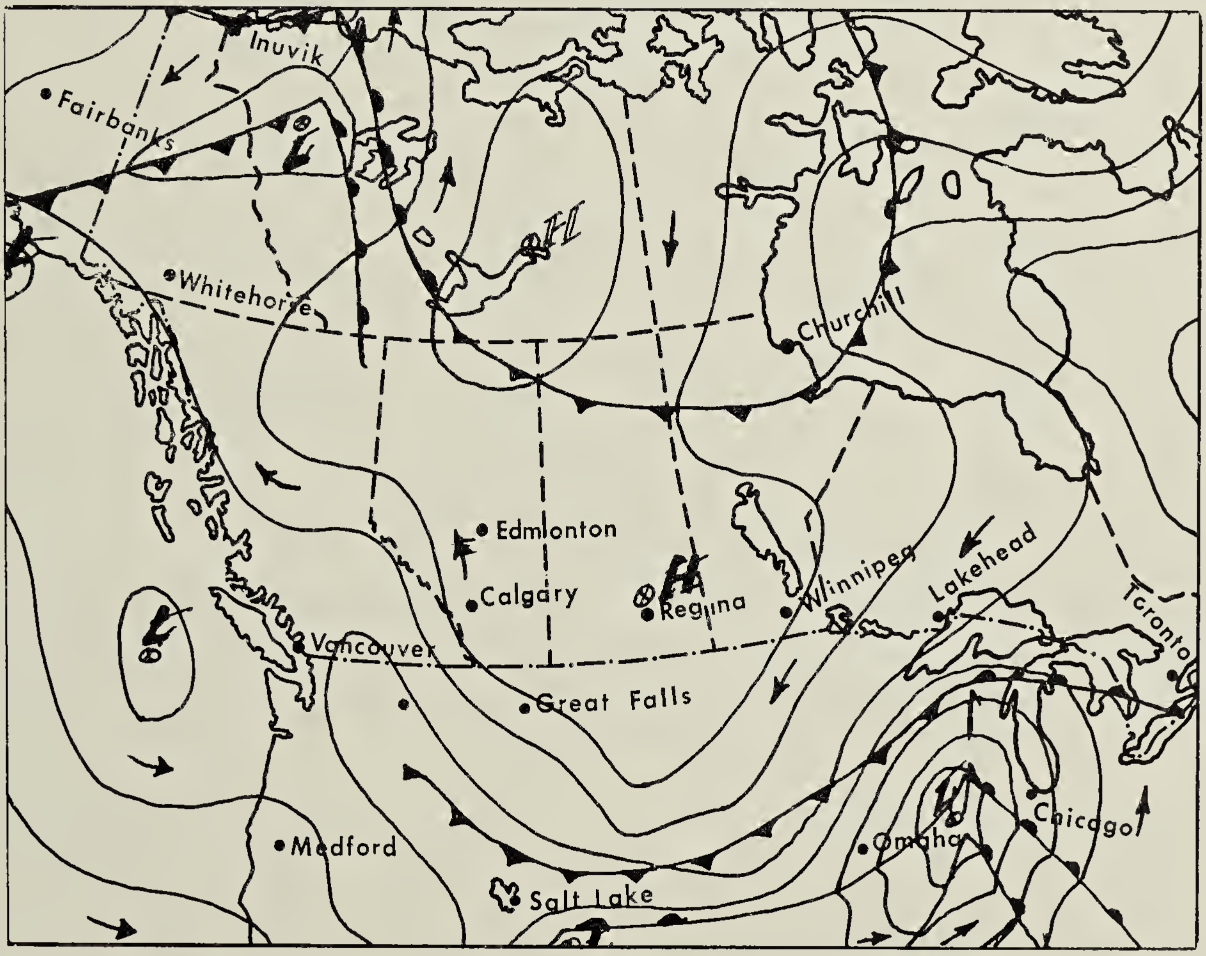

Fig. 1 — Weather map for May 11, 1967 showing the cold front associated with the low moving southeast from Fairbanks, Alaska.

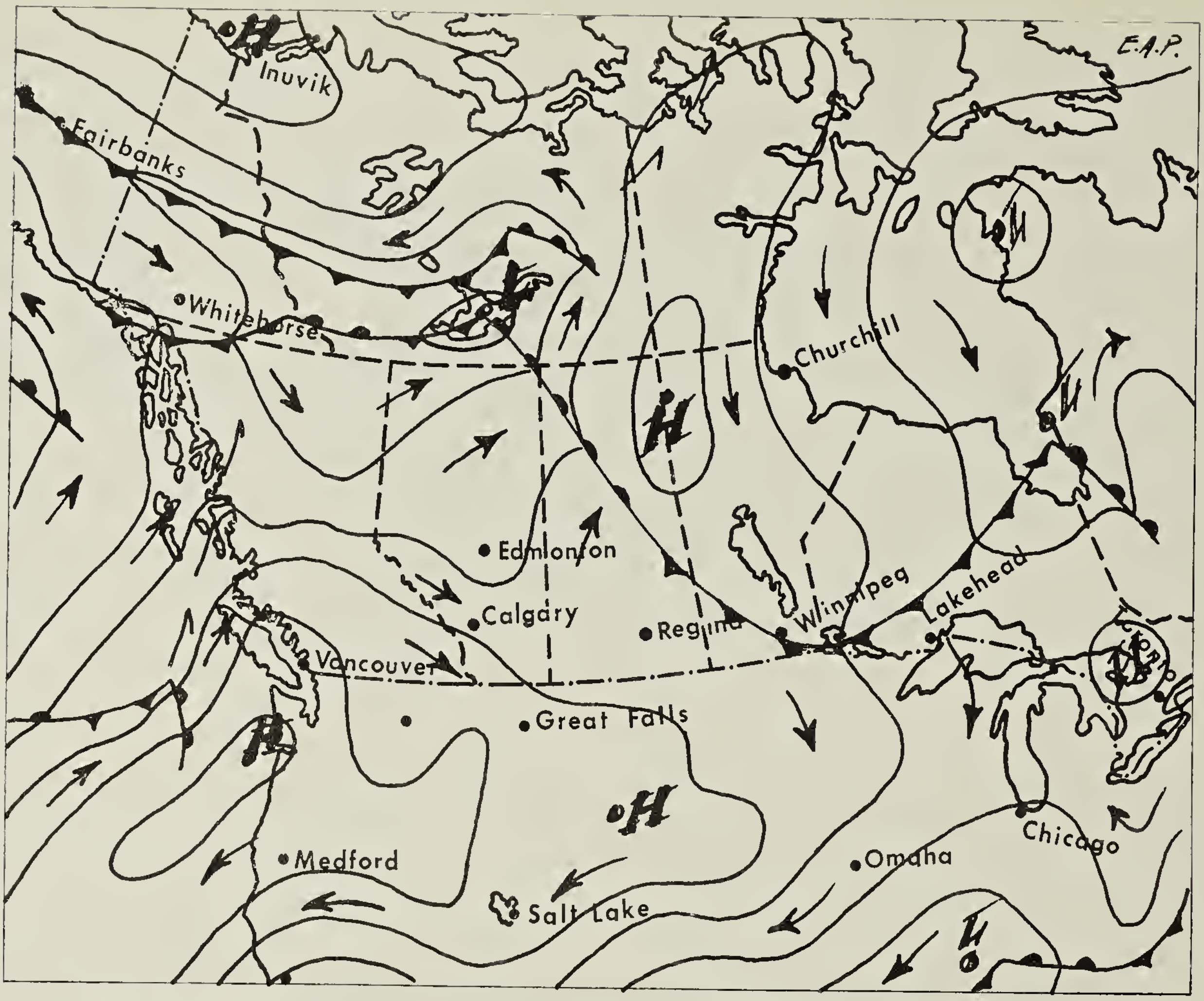

Fig. 2 — Weather map for May 14, 1967 showing the cold front moving southeast from Whitehorse, N.W.T.

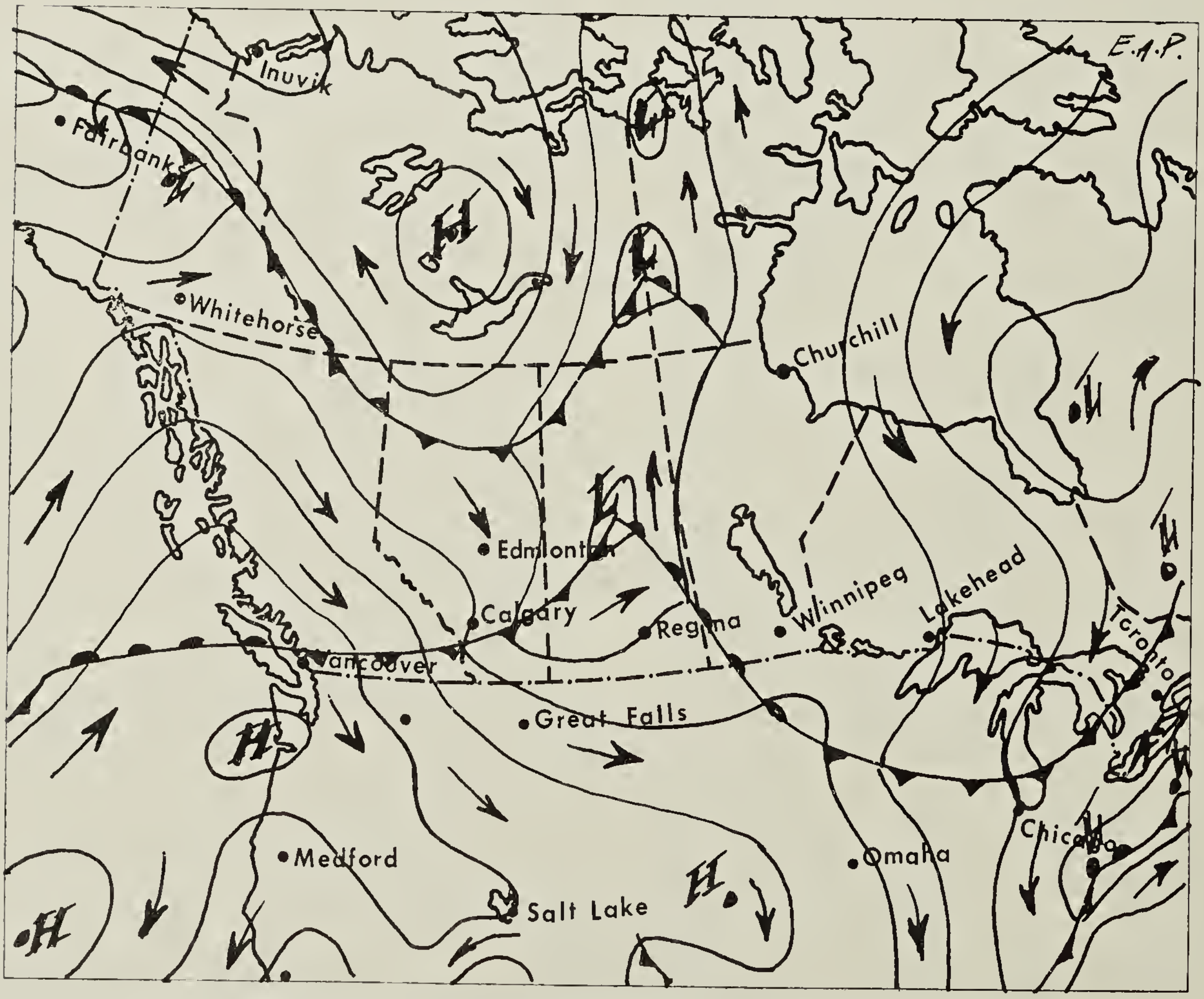

Fig. 3 — Weather map for May 15, 1967 with cold front in the Calgary area and with winds from the northwest.

coast of America in the fall, and that they may be blown inland from the British Columbia coast by weather systems from the Pacific during the month of May.

The implications are exciting. But nothing is yet certain, particularly since *most* spring records have been from the *eastern* half of the continent, which suggests that they are *not* Alaskan birds. But it will be interesting to analyze future western Canadian records in the light of *their* possible origin in Alaska. It seems likely that there will be additional May records. We should therefore keep a special watch for this species in future. If there is a North American breeding population outside Alaska of this remarkable bird it may be somewhere in the Canadian north, possibly even in one of the Prairie Provinces. If and when it is found, the location should be kept secret. And, of course, it is also important that as *few* specimens as possible should be collected, if the postulated breeding population is to flourish. The specimen collected in Alberta was, unfortunately, taken before its identity was realized. But perhaps, since this is a "lek" species, the two females got along happily enough with the remaining male in this instance!

Acknowledgements

The authors are grateful to the Calgary Weather Office for preparation of the weather maps.

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ANNUAL REPORT OF THE BRANDON JUNIORS' NESTBOX PROJECT

by **Les Rourke,** Brandon, Manitoba

The year 1967 proved to be another successful one for our nest lines. We now have over 1700 nest boxes set out, although only 1200 of these are listed in our field books.

There were two highlights in last year's activities. The first highlight was the great increase of Mountain Bluebirds, with the species more than doubling its former high mark of 79 nests.

The other item of importance was the finding of a hybrid male bluebird (Mountain X Eastern) which had both a Mountain Bluebird and an Eastern Bluebird mate. From the first of these two nests, six young were successfully hatched. This is reported to be the first example of a wild hybrid in the thrush family, let alone a successful back cross in the bluebird family in North America. A full report is in preparation.

Last summer we moved a number of nest boxes to new locations, and over 100 new boxes were built and set out. For 1968 we plan to build and set out over 100 more, some of these being replacements. Here are the totals of nests checked in 1967.

Species	*Total nests*
Common Goldeneye	1 (perhaps more)
Tree Swallow	1000+
Eastern Bluebird	55 first broods
Mountain Bluebird	160 first broods
Eastern Bluebird X Hybrid male	1 (nest unsuccessful)
Mountain Bluebird X Hybrid male (same male as above)	1 (nest successful)
House Sparrow	a few

COWBIRD EGG IN MOURNING DOVE NEST

by **Martin McNicholl,** 1281 Valour Road, Winnipeg

The Brown-headed Cowbird *(Molothrus ater)* is well known as a parasite of other bird species, usually laying its eggs in the nests of passerines, especially warblers and sparrows. However, I was surprised to find a cowbird egg, along with one dove egg, in the nest of a Mourning Dove *(Zenaidura macroura)* at 8:25 P.M. on June 15, 1965. The nest, which was about five feet above the ground in a lilac bush in Brookside Cemetery, Winnipeg, Manitoba, had contained one dove egg when found by David Hatch and the writer at 8:30 P.M. on the previous day. When examined at 9:30 P.M. two days later, the nest contained only two dove eggs. Since the nest was a flat platform of twigs, the cowbird egg, which is rounder than a dove's egg, could conceivably have rolled out when the adult dove took flight. Also, the dove could have rejected it and pushed it out. Finally, a Common Crow may have taken it, as a pair in the area were suspected of nest robbing in several cases. This may also explain the later disappearance of the two dove eggs.

The Mourning Dove is an unusual host for the cowbird. Houston (1966) does not include the Mourning Dove on his list of Saskatchewan bird hosts, nor does Terril (1961) for southern Quebec, Norris (1947) for Preston Frith, Pennsylvania, King (1954) for Whitman County, Washington, or Walkinshaw (1949) in a list of 25 eggs laid apparently by one cowbird. The first reported case of parasitism on a Mourning Dove was found in eastern Iowa in 1884 by E. H. King (Friedmann, 1963). Friedmann *(op. cit.)* lists another found by C. D. Kellogg at Rock Hill, Pennsylvania on May 25, 1899. Another is reported by Hicks for Ohio (Friedmann, *op. cit.*). Berger (1951) omits the Mourning Dove in a Michigan list, but later (as cited by Friedmann, *op. cit.*) added it to the Michigan list on the basis of a nest found near Ann Arbor. Friedmann *(op. cit.)* notes that Oberholser listed the western Mourning Dove in an unpublished manuscript on Texas birds, but without substantiating details, and that R. F. Johnston had a record for Kansas. Bent (1958) includes the Mourning Dove as a victim of the cowbird on the basis of the above records. The statement by W. M. Tyler in Bent (1932) under "Enemies" of the Mourning Dove that "The cowbird not infrequently selects the dove as a host for its young" is probably a misprint or error.

Kellogg's 1899 record (above) was for a Common Grackle's nest in which a Mourning Dove nested three days after a cowbird egg was laid. A young cowbird was later found in the nest, but, as Friedmann *(op. cit.)* points out, no evidence was obtained as to whether the grackle or the dove raised the young cowbird.

The Mourning Dove is undoubtedly in the category of an "accidental host", or a host in the nest of which the cowbird "dumps" her egg in desperation. As pointed out by Friedmann *(op. cit)* and Bent (1958) the difference in parent-young feeding habits makes the dove a most unsuitable host. Several other "host" species also fall into this category. Friedmann *(op. cit.)* gives records of Blue-winged Teal, Ferruginous Hawk, Upland Plover, Wilson's Phalarope, California Gull, Ground Dove, Yellow-billed Cuckoo, Black-billed Cuckoo, Red-headed Woodpecker, and Blue Jay, with substantiating records, and unsubstantiated records of Killdeer, Ruby-throated Hummingbird, and

Common Crow. Several other species of passerines listed by him may also be "accidental hosts." In addition, Hatch (1967) provides a substantiated record for the Common Crow.

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BANK SWALLOWS IN GRAVEL STOCK-PILES IN MANITOBA

by **Robert W. Nero**, Manitoba Museum of Man and Nature,
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The use of gravel stock-piles by Bank Swallows for nesting sites has been recorded for nine localities in Saskatchewan (*Blue Jay*, 19:20, 84, 115, 174; 22:42), but has evidently not previously been reported for Manitoba. I found an active colony on August 12, 1967 about 18 miles east of Winnipeg where several gravel stock-piles lie adjacent to water-filled excavations on the north side of highway No. 15. Fifty-three apparently active nest burrows were found in a large stock-pile and on a southwest-facing embankment about 12 feet high and 25 feet long. Broken eggs and dead newly-hatched young lying on the slope beneath the face of the embankment had clearly resulted from nests being dug out a few days earlier by vandals. Incubation was evidently still in progress, since several adults were flushed from the burrows a long time after the flock had been milling about us. This is a late date for nesting for this species which, in Manitoba, normally has begun to migrate by the third week in August. The material in this stock-pile was a very compact, fine, sandy gravel, almost a coarse sand.

An older, abandoned colony site with about 100 nest burrows was found on a west-facing cut on a nearby pile. A third pile was of some interest in that in contrast with the other piles which were devoid of vegetation it had a few clumps of sow-thistle, Canada thistle, and choke-cherry on top. Gravel had not yet been removed from this pile, hence it offered only gentle slopes in which burrow excavation would not be possible. Bank Swallow nesting sites seem to require a nearly vertical face. The removal of sand or gravel from a stock-pile of suitably compacted material results in the formation of such an embankment. Later slumping may improve the site by forming a new and better face or it may demolish the colony, depending upon the timing. Nesting also requires a cessation of gravel removal operations following the initial establishment of a cut. These several factors may only occasionally be met, but it is clear that Bank Swallows are especially adapted to taking advantage of transitory cut-banks, not only along streams and in excavations but also in the wholly artificial situation of sand and gravel stock-piles.

BIRDS OBSERVED IN NORTH-CENTRAL ALBERTA, SUMMER 1964

by **Anthony J. Erskine,** Canadian Wildlife Service,
Sackville, New Brunswick

In the summer of 1964, I spent six weeks studying Buffleheads *(Bucephala albeola)* north of Lesser Slave Lake, in north-central Alberta. This report summarizes bird observations made by me during this period, together with a few made by my companion, Wayne P. McCrory, and by local residents. Birds of nearby areas have been reported by Baker and Walkinshaw (1946), Soper (1949), and Godfrey (1952).

The areas visited in 1964 lie close to the "Whitefish road"* from Grouard to Atikameg, and chiefly between Salt Prairie and Gift Lake (Fig. 1). A few observations were made on July 8-9 along the road northeast from Atikameg to Red Earth and Trout Mountain. These roads are largely ungravelled, and may be impassable for motor vehicles in wet weather. Lakes away from the road were reached only on foot, along logging tracks or survey lines.

Most of the area is covered with aspen *(Populus tremuloides)* and balsam poplar *(P. balsamifera)* forests. A few stands of white spruce *(Picea glauca)*, occasionally mixed with balsam fir *(Abies balsamea)*, persist where they have escaped fire and logging. The hollows are occupied either by black spruce *(P. mariana)* muskegs or by willow-alder *(Salix-Alnus* spp.*)* swales along brooks. Some land along the road near Salt Prairie is cultivated, and a few fields have been cleared near the settlement at Gift Lake. The terrain is gently rolling, with an average elevation of about 2200 feet. The highest and lowest elevations along the road north from Atikameg are about 2550 feet at Trout Mountain and about 1650 feet at Loon Lake.

We visited the area briefly on June 3, 6, and 11-12, before setting up camp at Gift Lake. Except for the periods July 2-4, July 14-16 and July 28-31, we remained there from June 15 until August 4.

Annotated List

For each species is given the number of dates upon which it was recorded and the maximum number of adults seen on one day, thus "18—3", the habitat in which it was found, and any breeding evidence obtained. Names used follow the A.O.U. Check-list (1957).

Nesting data have been recorded in detail with the Prairie Nest Records Scheme, Manitoba Museum of Man and Nature, Winnipeg.

Common Loon *Gavia immer*: 18—3, large and small lakes.

Red-necked Grebe *Podiceps grisegena*: 25—10, large and small lakes; nests or broods at 11 localities, first young June 19.

Horned Grebe *Podiceps auritus*: 22—11, large and small lakes; nests or broods at six localities, first young July 8.

Eared Grebe *Podiceps caspicus*: 5—50, scattered individuals except at Loon Lake, an area with lush emergent and submerged vegetation, where the only breeding was noted; small young July 9.

Western Grebe *Aechmophorus occidentalis*: 3—6, only at Grouard, another productive marsh area; half-grown young August 3.

Pied-billed Grebe *Podilymbus podiceps*: 5—2, at three localities, including two fertile marshes and one muskeg pond; broods July 7 and July 18.

White Pelican *Pelecanus erythrorhynchos*: McCrory saw a number at Utikuma Lake August 3; local resi-

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* Local names are given in quotation marks.

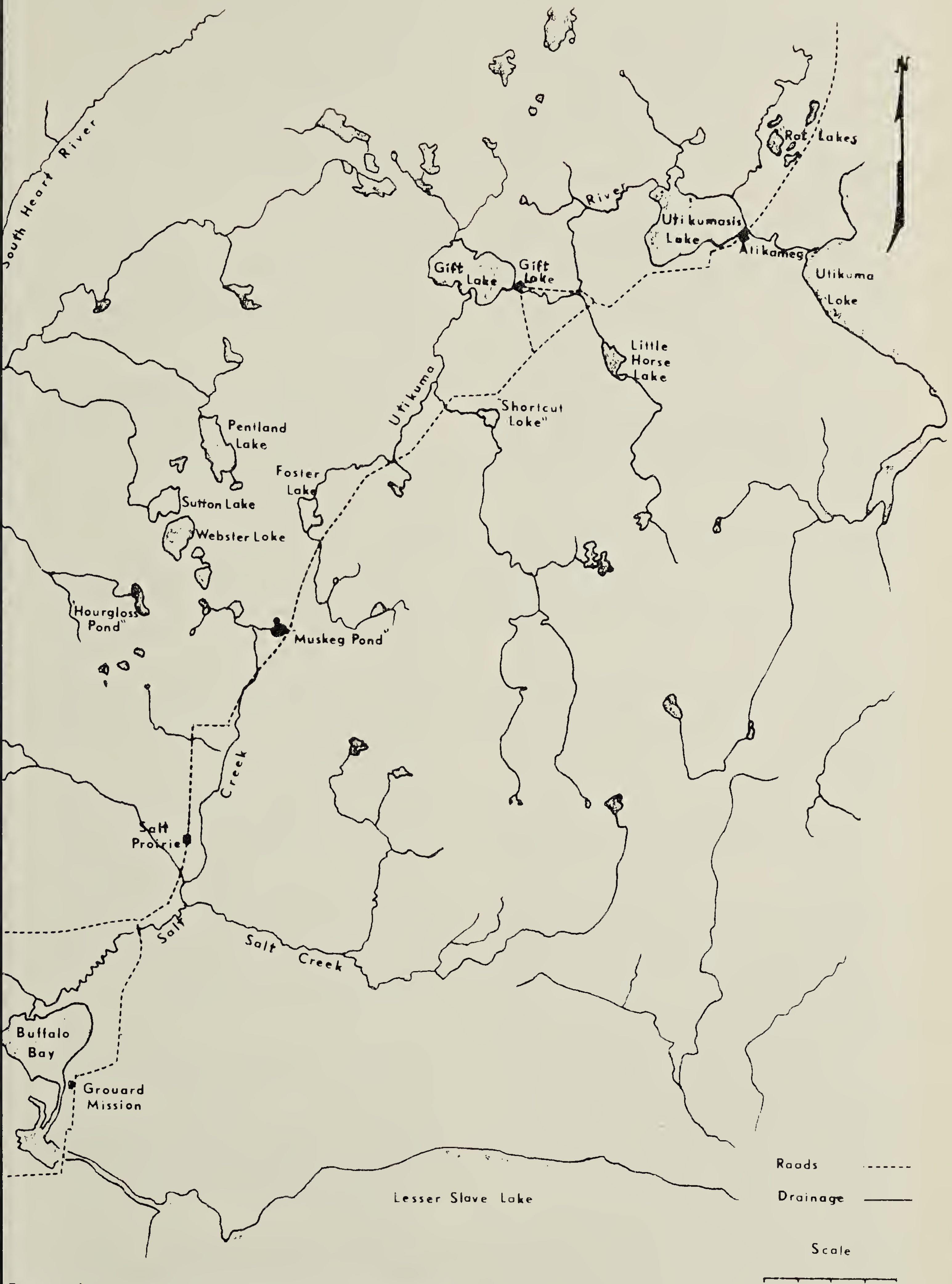

Figure 1. Map of Grouard-Atikameg Area, Alberta

dents reported pelicans to be regular at Utikuma and Pentland ("Pelican") Lakes.

Great Blue Heron *Ardea herodias*: one bird at Grouard July 14.

American Bittern *Botaurus lentiginosus*: local residents reported one near "Shortcut Creek" in early June.

Mallard *Anas platyrhynchos*: 27—30, scattered individuals except on a few fertile lakes; broods at 7 localities; first young June 11.

Gadwall *Anas strepera*: 3—10, at Loon Lake; singles elsewhere.

Pintail *Anas acuta*: 4—15, all at Grouard.

Green-winged Teal *Anas carolinensis*: 21—20, mostly on smaller lakes, and even on ponds in dense woods; nests or broods at 8 localities; first young June 25.

Blue-winged Teal *Anas discors*: 22—10, on most lakes, especially smaller ones, but little breeding evidence was obtained; broods at "Muskeg Pond" July 17 and 25, and at Horse Creek July 22.

American Widgeon *Mareca americana*: 27—18, large and small lakes; broods at 10 localities; first young June 17.

Shoveler *Spatula clypeata*: 8—5, scattered individuals except at a few fertile localities; nest at "Rat Lakes" June 23, brood at Grouard July 17.

Redhead *Aythya americana*: 9—4, only at two fertile areas; broods at "Rat Lakes" July 21 and at Grouard August 3.

Ring-necked Duck *Aythya collaris*: 8—20, mainly on muskeg lakes; broods at Foster Lake July 13, and at "Muskeg Pond" July 17 and 25.

Canvasback *Aythya valisineria*: 4—20, only on fertile lakes; nest at "Rat Lakes" June 23, brood at Grouard August 3.

Lesser Scaup *Aythya affinis*: 33—95, also pre-moulting flock of 250 birds July 13; large and small lakes; nests or broods at 8 localities; first young July 8.

Common Goldeneye *Bucephala clangula*: 23—10, also pre-moulting flock of up to 100 birds on June 12, 16, 17 and July 6; large and small lakes; one nest and broods at 8 other localities; first young June 19.

Barrow's Goldeneye *Bucephala islandica*: 8—6, large and small lakes; mostly pre-moulting males, including some with large flock of Common Goldeneyes.

Bufflehead *Bucephala albeola*: 32-22, also pre-moulting flocks of 150 birds June 12, 16, 17 and of 200 birds July 8; mostly on smaller lakes; nests or broods at 7 localities; first young June 18.

White-winged Scoter *Melanitta deglandi*: 26—20, large and small lakes; broods on Little Horse Lake July 22 and on Foster Lake July 27.

Surf Scoter *Melanitta perspicillata*: two males on "Shortcut Creek" July 20.

Ruddy Duck *Oxyura jamaicensis*: 21—15, large and small lakes, but breeding only at "Rat Lakes", a fertile area; nest June 23, broods July 21.

Goshawk *Accipiter gentilis*: one over pond north of Peerless Lake July 8.

Cooper's Hawk *Accipiter cooperii*: an immature-plumaged bird at Gift Lake June 17.

Red-tailed Hawk *Buteo jamaicensis*: 17—2, mostly over poplar forest; two birds by a nest 40 feet up in a balsam poplar June 18, but nest empty when checked June 30.

Bald Eagle *Haliaeetus leucocephalus*: an adult at Utikumasis ("Little Whitefish") Lake near Atikameg July 10.

Marsh Hawk *Circus cyaneus*: 7—1, mostly over sedge meadows by lakes.

Sparrow Hawk *Falco sparverius*: 25—8, also group of 12 including flying young July 27; mostly along edges of cleared land north of Salt Prairie, where newly-flying young were seen July 18.

Spruce Grouse *Canachites canadensis*: a male near "Muskeg Pond" June 18; McCrory saw a female with brood in the same area July 18.

Ruffed Grouse *Bonasa umbellus*: 6—2, all in poplar woods; at least 4 broods, the first June 22.

Sharp-tailed Grouse *Pedioecetes phasianellus*: an adult with 3 flying young in grassland north of Salt Prairie July 27.

Sora *Porzana carolina*: 14—6, in marshes by large and small lakes.

American Coot *Fulica americana*: 29—50, large and small lakes, but most numerous in fertile areas; broods at 5 localities; first young June 23.

Killdeer *Charadrius vociferus*: 25—3, largely on cultivated land near Salt Prairie and Gift Lake; no broods seen, but behaviour of adults suggested nests or young nearby.

Common Snipe *Capella gallinago*: 21—3, largely in sedge meadows beside lakes; McCrory saw an adult with one one-third-grown young near Webster ("Callahassee") Lake June 26.

Upland Plover *Bartramia longicauda*: one bird by the road near "Muskeg Pond" July 17.

Spotted Sandpiper *Actitis macularia*: 15—3, largely in cleared areas by Gift Lake.

Solitary Sandpiper *Tringa solitaria*: 30—7, any wet area, even tiny pools in dense forest; a group thought to be of flying young July 21, and two small young (one caught and examined) with adults near Atikameg August 4.

Lesser Yellowlegs *Totanus flavipes*: 29—16, around all lakes; adult behaviour suggested breeding in area.

Pectoral Sandpiper *Erolia melanotos*: 2—4, presumably migrants, first July 9.

Least Sandpiper *Erolia minutilla*: 4—8, presumably migrants, first July 8.

Dowitcher (probably Long-billed) *Limnodromus (? scolopaceus)*: 3—11, all adults; presumably migrants, first July 6.

Semipalmated Sandpiper *Ereunetes pusillus*: 2—10, presumably migrants, first July 9.

Northern Phalarope *Lobipes lobatus*: 4 adults at Loon Lake July 9, presumably migrants.

Wilson's Phalarope *Steganopus tricolor*: 6—4, mainly around fertile lakes; behaviour of adults at "Muskeg Pond" suggested nest or brood nearby.

Franklin's Gull *Larus pipixcan*: 25—200, around lakes and agricultural land, but large numbers only in fertile areas; flying young at Grouard and Atikameg August 3-4.

Bonaparte's Gull *Larus philadelphia*: 5—32, large and small lakes; a partly feathered young north of Peerless Lake July 8, first flying young at Atikameg August 4.

Common Tern *Sterna hirundo*: 7—10, only at larger lakes; nesting, including one pair on a muskrat house, in marsh at Grouard, where flying young first seen August 3. Birds thought to be Forster's Terns were seen there on 4 dates, but all flying young August 3 were Common Terns.

Black Tern *Chlidonias niger*: 34—55, mainly at larger lakes; flightless young at "Rat Lakes" and Little Horse Lake, from June 23; first flying young at Loon Lake July 9.

Rock Dove *Columba livia*: two at Salt Prairie July 20; local residents reported them nesting in barns nearby.

Mourning Dove *Zenaidura macroura*: 3—1, near "Rat Lakes", Salt Prairie, and Grouard.

Great Horned Owl *Bubo virginianus*: one bird at Gift Lake July 23.

Nighthawk *Chordeiles minor*: 24—3, over woods, cleared areas, and lakes.

Belted Kingfisher *Megaceryle alcyon*: 2—1, at Utikuma River near Gift Lake, June 16 and July 12.

Yellow-shafted Flicker *Colaptes auratus*: 30—8, largely in burns and areas of drowned trees around lakes; nests in 5 localities, first flying young July 4.

Pileated Woodpecker *Dryocopus pileatus*: 2—2, in poplar forest.

Yellow-bellied Sapsucker *Sphyrapicus varius*: 24—6, in poplar forest; nests in 4 localities, first hatched young heard June 16.

Hairy Woodpecker *Dendrocopos villosus*: 3—3, in poplar forest; male feeding young in nest near Pentland Lake June 22.

Downy Woodpecker *Dendrocopos pubescens*: 3—3, probably two adults and one newly flying young, west of Webster Lake June 24; in poplar forest.

Northern Three-toed Woodpecker *Picoides tridactylus*: a male by "Hourglass Pond" June 24, in an area of burned black spruce.

Eastern Kingbird *Tyrannus tyrannus*: 27—4, largely in alder-willow swales along creeks; a group believed to be of flying young was seen July 20.

Traill's Flycatcher *Empidonax traillii*: 16—6, largely in alder-willow swales.

Least Flycatcher *Empidonax minimus*: 19—7, largely in poplar forest.

Western Wood Pewee *Contopus sordidulus*: 33—7, largely in poplar forest.

Olive-sided Flycatcher *Nuttallornis borealis*: 13—2, in mixed poplar-white spruce forest.

Tree Swallow *Iridoprocne bicolor*: 27—15, mostly around lakes.

Bank Swallow *Riparia riparia*: 2—20, at Grouard.

Barn Swallow *Hirundo rustica*: 2—2, around settlements; two adults feeding large young in nest in toolshed at Red Earth July 9.

Cliff Swallow *Petrochelidon pyrrhonota*: 9—30, all at Grouard except at Loon Lake July 9.

Purple Martin *Progne subis*: 14—6, mostly around lakes; adults entering an empty flicker hole in a poplar stub near Webster Lake June 30.

Gray Jay *Perisoreus canadensis*: 24—5, largely in conifer forest; first flying young June 3.

Blue Jay *Cyanocitta cristata*: 3—1, near Salt Prairie, "Shortcut Creek", and Gift Lake.

Common Raven *Corvus corax*: 4—4.

Common Crow *Corvus brachyrhynchos*: 8—4, only twice north of cultivated land near Grouard and Salt Prairie.

Black-capped Chickadee *Parus atricapillus*: 18—3, also group of 9 including newly flying young fed by adults at Gift Lake June 17; in all forests.

Boreal Chickadee *Parus hudsonicus*: 6—2, only in coniferous forest.

Red-breasted Nuthatch *Sitta canadensis*: one in mature spruce forest near Webster Lake June 26.

House Wren *Troglodytes aedon*: 8—3, largely in poplar forest.

Winter Wren *Troglodytes troglodytes*: 4—3, all in mature spruce forest near Webster Lake.

Long-billed Marsh Wren *Telmatodytes palustris*: 4—7, only in more fertile marsh areas; dummy nest found at "Rat Lakes" June 23.

Robin *Turdus migratorius*: 40—15, in all areas; nest with eggs at "Shortcut Creek" June 19 was perhaps a second nesting.

Hermit Thrush *Hylocichla guttata*: 10—3, largely in conifer or mixed forest.

Swainson's Thrush *Hylocichla ustulata*: 19—8, mostly in poplar forest; young left nest near Webster Lake June 30.

Mountain Bluebird *Sialia currucoides*: a male east of Red Earth July 8.

Golden-crowned Kinglet *Regulus satrapa*: two in mature spruce forest near Webster Lake June 18.

Ruby-crowned Kinglet *Regulus calendula*: 7—3, largely in conifer or mixed forest.

Cedar Waxwing *Bombycilla cedrorum*: 21—8, largely in cleared areas and along creeks.

Starling *Sturnus vulgaris*: 15—3, mostly around cleared areas; large young in nest near Webster Lake June 30.

Red-eyed Vireo *Vireo olivaceus*: 15—4, largely in poplar forest.

Warbling Vireo *Vireo gilvus*: 12—4, mostly around settlements.

Black-and-white Warbler *Mniotilta varia*: 10—2, largely in poplar forest.

Tennessee Warbler *Vermivora peregrina*: 12—12, largely around black spruce muskegs.

Yellow Warbler *Dendroica petechia*: 17—6, largely in alder-willow swales along creeks and lakeshores.

Magnolia Warbler *Dendroica magnolia*: two in mature spruce forest north of Salt Prairie June 11.

Cape May Warbler *Dendroica tigrina*: two in mature spruce forest near Webster Lake June 18.

Myrtle Warbler *Dendroica coronata*: 8—4, largely in conifer forest.

Black-throated Green Warbler *Dendroica virens*: 2—1, in mature spruce forest near Webster Lake June 22 and 24.

Bay-breasted Warbler *Dendroica castanea*: 2—1, in mature spruce forest near Webster Lake June 24, 26.

Blackpoll Warbler *Dendroica striata*: 2—4, in spruce forest north of Salt Prairie June 11 and at Gift Lake June 16.

Palm Warbler *Dendroica palmarum*: 3—2, all in black spruce muskeg; adults carrying food June 24.

Ovenbird *Seiurus aurocapillus*: 17—4, largely in poplar forest.

Northern Waterthrush *Seiurus noveboracensis*: 11—9, largely in alder-willow swales along creeks and lakeshores.

Connecticut Warbler *Oporornis agilis*: one north of Salt Prairie June 11.

Mourning Warbler *Oporornis philadelphia*: 8—5, largely in mixed or poplar forest.

Yellowthroat *Geothlypis trichas*: 8—4, largely in alder-willow swales along creeks.

American Redstart *Setophaga ruticilla*: 7—2, largely in poplar forest.

House Sparrow *Passer domesticus*: 12—10, around settlements.

Yellow-headed Blackbird *Xanthocephalus xanthocephalus*: 2—2, only in fertile marshes.

Red-winged Blackbird *Agelaius phoeniceus*: 40—40, largely in sedge meadows around lakes; first flying young June 23, young from presumed second nests flying July 30.

Baltimore Oriole *Icterus galbula*: a male seen and 2 heard near "Rat Lakes" June 23.

Rusty Blackbird *Euphagus carolinus*: 7—3, largely in black spruce muskegs.

Brewer's Blackbird *Euphagus cyanocephalus*: 5—10, largely around agricultural areas.

Common Grackle *Quiscalus quiscula*: 14—15, largely in alder-willow swales near water; a nest with eggs near Webster Lake June 18 may have been a second nesting.

Brown-headed Cowbird *Molothrus ater*: 12—150, mostly large flocks of males around setlements, in June.

Western Tanager *Piranga ludoviciana*: one male in mature spruce forest near Webster Lake June 26.

Rose-breasted Grosbeak *Pheucticus ludovicianus*: 4—1, in poplar forest.

Evening Grosbeak *Hesperiphona vespertina*: one bird at Gift Lake June 29.

Purple Finch *Carpodacus purpureus*: 3—3, all in poplar forest.

Pine Grosbeak *Pinicola enucleator*: a female-plumaged bird near "Hourglass Pond" June 24.

Pine Siskin *Spinus pinus*: 10—3, largely in mixed or conifer forest.

American Goldfinch *Spinus tristis*: one heard at Gift Lake June 18.

White-winged Crossbill *Loxia leucoptera*: 6—10, largely in conifer forest.

Savannah Sparrow *Passerculus sandwichensis*: 5—3, in agricultural land, and clearings.

Le Conte's Sparrow *Passerherbulus caudacutus*: 10—3, in sedge meadows around lakes.

Sharp-tailed Sparrow *Ammospiza caudacuta*: 5—2, in sedge meadows around lakes.

Vesper Sparrow *Pooecetes gramineus*: 3—2, all in grassland near Salt Prairie and Grouard.

Slate-colored Junco *Junco hyemalis*: 18—6, also groups totalling 15, including flying young July 18; largely in mixed or poplar forest.

Chipping Sparrow *Spizella passerina*: 15—8, largely in poplar forest.

Clay-colored Sparrow *Spizella pallida*: 7—2, all in bushy clearings along roads or around lakes.

White-throated Sparrow *Zonotrichia albicollis*: 26—6, largely in poplar and mixed forest.

Fox Sparrow *Passerella iliaca*: 11—2,

all in alder-willow swales along Utikuma River at Gift Lake.

Lincoln's Sparrow *Melospiza lincolnii*: 21—6, largely in brushy areas around lakes.

Swamp Sparrow *Melospiza georgiana*: 12—3, largely in alder-willow swales along creeks and lakeshores.

Song Sparrow *Melospiza melodia*: 18—5, in all "edge" habitats.

Discussion

Uncritical comparison of this list with others from nearby areas may lead to unwarranted conclusions. My studies were concerned with waterfowl, so wetland habitats received disproportionately more attention than did other habitats. While only one-third (44 out of 138) of the species seen in the area can be classed as water birds or water-edge species, no less than 18 of the 30 species most frequently noted were in these categories. Birds of forest and shrub habitats were observed frequently while travelling between water areas, but grassland and cultivated areas were scarcely visited except on our trips to and from High Prairie for supplies. Studies reported by Soper (1949) and Godfrey (1952) covered much more open country than this study area. Soper's work emphasized field observations of waterfowl, so my list is likely to be more comparable with his than with that of Godfrey, who spent much time collecting and preparing museum specimens. Both Godfrey and Soper, however, visited many of the same areas, so the proportions of time they spent in various habitats may have been more similar than the nature of their work would suggest. Only the marshes at Grouard were included in all three studies.

Soper ranked the duck species in order of abundance, so it is possible to make objective comparisons between his list of these birds and mine. Leaving aside species seen only occasionally, there is close agreement except for four species, Shoveler ranking much higher on Soper's list, and Green-winged Teal, Ring-necked Duck, and Bufflehead much higher on mine. The high ranking of Bufflehead in my list is obviously due to my efforts to seek out this species. Nevertheless, all three ducks that I found relatively more common than did Soper are species characteristic of waters in forested regions. The Shoveler is more commonly found in fertile, muddy marshes is grassland regions. Godfrey's data do not permit objective ranking of duck species in order of abundance, but only two species differed markedly in status between his list and Soper's. Godfrey found Pintail one of the commonest ducks while Soper found it uncommon, and the reverse was true for White-winged Scoters. However, Soper found the latter chiefly in the Grande Prairie region, where Godfrey spent little time.

For birds other than ducks, Soper presented only general statements — "abundant", "common", "uncommon", "rare." My numerical data indicate that the species seen in greatest numbers were the same ones which I saw most frequently, while those seen in lesser numbers appeared less often. Accordingly, one may consider those seen on 20 or more days as "common" or "abundant", those seen on 10-19 days as "fairly common", those seen on 3-9 days as "uncommon", and those seen only once or twice as "casual." There is no way of knowing whether the terms so assigned have the same meaning as when Soper used them. Most species whose status differed between Soper's list and this one are characteristic of habitats better represented in one or the other study; for example:

Species more often seen in 1944
    (open country species)
    Eared Grebe
    Marsh Hawk
    Common Crow
    Long-billed Marsh Wren
    Western Meadowlark
    Brewer's Blackbird
    Savannah Sparrow
    Vesper Sparrow
Species more often seen in 1964
    (woodland species)
    Common Loon

Horned Grebe
Pied-billed Grebe
Common Snipe
Solitary Sandpiper
Rusty Blackbird
Sharp-tailed Sparrow

A few species seen in 1964 have colonized this region since Soper's visit in 1944, among them Starlings (cf. Godfrey, 1952; Myres, 1958), Barn Swallows, and perhaps Mourning Doves. Other differences are less easily explained, and some may represent year-to-year changes in abundance. Such fluctuations undoubtedly occur in all birds, but they have received little attention except among game birds and threatened species. Species which may fall into this category include Great Horned Owl, Eastern Phoebe, Red-breasted Nuthatch, Solitary Vireo, Golden-crowned Kinglet, Connecticut Warbler, American Redstart, and Western Tanager, apparently more abundant in 1944, and Sparrow Hawk, Franklin's Gull, and Palm Warbler, apparently more abundant in 1964. The change was particularly striking for Franklin's Gull, which Soper identified only twice although both Godfrey and I found it abundant. Soper undoubtedly was familiar with this species, so that misidentification need not be considered, but the difference in status seems too great to be explained solely as annual fluctuation. The unusually large numbers of Bonaparte's Gulls listed by Soper during August make one wonder if his accounts of these two species could have been transposed.

Summary

This paper lists 138 species of birds observed in 1964 during studies of waterfowl north of Lesser Slave Lake, Alberta. Comparison of relative frequency and abundance of birds showed more species characteristic of forested country and fewer birds of open country than were observed by Soper in nearby areas during waterfowl studies in 1944. Other differences are thought to be the result of year-to-year fluctuations in numbers.

Addendum

Field work elsewhere in the Peace River-Slave Lake region during the summer of 1964 produced a few records of interest, some of which support the variations in numbers suggested above. These records are given below.

Pied-billed Grebe: heard or seen near Whitelaw June 2 and 9, and near Fairview June 8 and 13. Not previously reported in region.

Green-winged Teal: noted daily near Fairview and Whitelaw in early June. More common than suggested in previous publications.

Barrow's Goldeneye: one male and four female-like birds near Fairview June 8. Only one previous record.

Surf Scoter: one male near Fairview May 29. Presumably a delayed migrant.

Gyrfalcon *Falco rusticolus*: one north of Whitelaw, June 2, and one, possibly the same, north of Fairview the following day. Not previously reported in region. Also a delayed migrant.

Barn Swallow: at least 6 near Desmarais June 4; one near Joussard July 1. Apparently a recent arrival.

Veery *Hylocichla fuscescens*: one heard in same area near Fairview May 30, June 7 and 13. Not previously reported except for old record which Godfrey (1952) rejected.

Orange-crowned Warbler *Vermivora celata*: one near Fairview May 31. Presumably a late migrant.

Wilson's Warbler *Wilsonia pusilla*: one near Fairview May 30. Not previously reported in region.

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A STUDY OF THE PRAIRIE FALCON IN SOUTHERN ALBERTA

by **Barry F. Edwards,** 6008 Bowwater Crescent N.W., Calgary

Because of the rapid decline in the Peregrine Falcon *(Falco peregrinus)* across most of North America in recent years, I decided to make a study of its close relative the Prairie Falcon *(F. mexicanus)* during the summer of 1967. In undertaking this study, I hoped first to establish that the population of the Prairie Falcon was in a more healthy state than the Peregrine, as had been suggested by the fact that John Campbell found 33 young in eight nests of this species on June 18 and 19, 1966, in southern Alberta, an average of over four young per nest (*Calgary Bird Club Bulletin*, 48:3).

This paper based on eight Prairie Falcon nest sites or eyries studied from April to August 1967, includes descriptions of each nest site, gives data on hatching and fledging success, and shows how the food taken varies as the season progresses and between pairs. Exact locations of these eyries have been omitted for security purposes.

I should like to acknowledge the assistance of Dr. M. T. Myres of the University of Calgary in planning the study and preparing this paper.

METHODS

The nests were marked with stakes requesting that they be left undisturbed, and subsequently none of the sites seemed to have been directly interfered with by human beings.

Nearly all visits had to be made in the evening, hence few traces of the species of prey fed upon in the morning remained. I kept the visits as short as possible while the birds were still incubating. As the eggs became further incubated the females became more aggressive and after the young hatched it seemed very unlikely that the birds would desert. The length of a visit has to be judged carefully especially since the temperament and sentitivity of different females varies.

A. NEST SITES

All eight nest sites were within a 25-mile radius, but they do not represent the total population of that area since I checked only the most obviously suitable nest areas, i.e., cliff outcrops associated with rivers and creeks. Five sites were along a stretch of river, with the two farthest nests being about seven miles apart. All were on the north side of the river. The other three nest sites were in outcrops close to water, two overlooking creeks and the third beside a reservoir.

Nest Site Descriptions

Nest Site 1: A wind-eroded hollow in a sandstone cliff, 10 feet from the crest, 15 feet from the foot, with a long, steep talus slope with clumps of vegetation. The birds had an uninterrupted view across the river valley.

Nest Site 2: (Fig. 1) A wind-eroded ledge on a sandstone cliff, 12 feet from the crest, 15 feet from the foot, with a short grassy talus slope. The birds had an uninterrupted view across the river valley.

Nest Site 3: A ledge at the back of a cave in a wind-eroded sandstone cliff, 7 feet from the crest, 10 feet from the foot with a short, gentle talus slope. The birds had no view of the area directly below the nest site.

Nest Site 4: (Fig. 2) A wind-eroded hollow of a sandstone cliff, 10 feet from the crest, 25 feet from the foot, with a short, steep, grassy talus slope. The birds had a clear view across the valley.

Nest Site 5: A wind-eroded hollow of a sandstone cliff, 7 feet from the crest, 10 feet from the foot, with a long, steep talus slope with clumps of vegetation. The birds had a clear view across the valley.

Nest Site 6: A roofed wind-eroded ledge of a sandstone cliff overlooking a creek, 10 feet from the crest, 15 feet from the foot with a long, steep talus

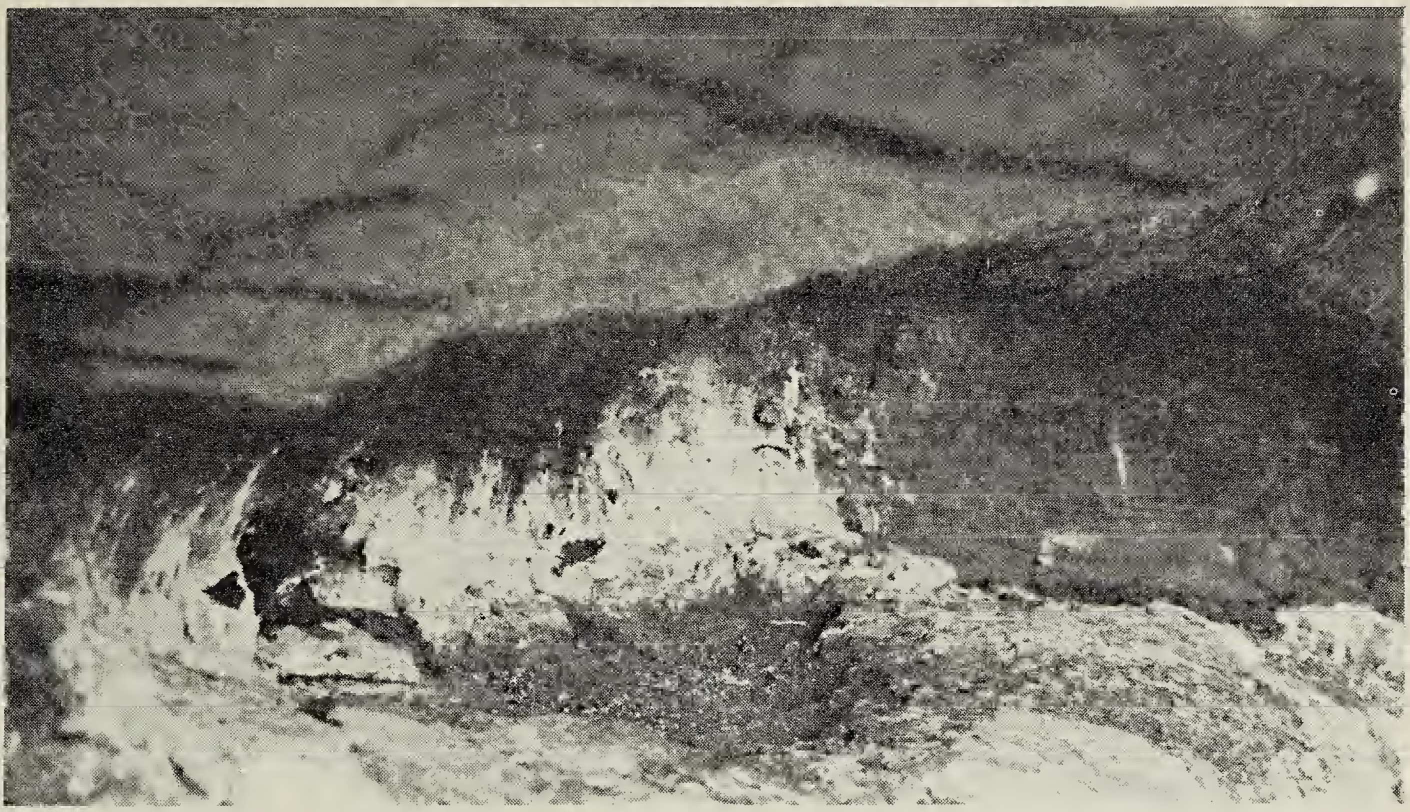

Fig. 1 — Nest site no. 2; a typical nest ledge.

slope. The birds had an uninterrupted view across the valley.

Nest Site 7: An open ledge of a sandstone cliff overlooking a creek, 8 feet from the crest, 15 feet from the foot, with a long talus slope. The birds had a view across the valley.

Nest Site 8: A wind-eroded hollow of a sandstone cliff beside a reservoir, 5 feet from the crest, 30 feet from the foot, with a short, steep talus slope.

Summary

Five of the eyries were in wind-eroded hollows, two on covered ledges and one on an open ledge. Hollows possibly provide downy young with better protection from aerial predators. Older young occupying hollows seemed to be more aggressive than young in other sites. All nest sites but one afforded the birds a clear view across the valley. The birds evidently (see Table 1) choose eyries as close to the top of the cliff as possible, presumbably to provide them with maximum protection from land predators and to give them a commanding view of the area below the site.

Nest sites 1 to 5 were in mixed farming and ranching areas with natural grassland above the tops of the cliffs. Nest sites 6, 7 and 8 were in ranching country. The latter three sites raised seven young, an average of 2.3 young per nest, while the eyries in the mixed farming and ranching area raised seven young, an average of only 1.4 young per nest.

Human habitation did not seem to affect the falcons in their choice of nest sites: nest site 7 was about 100 yards from a house, nest site 4 was about 200 yards from a farm house, and nest site 8 was about an eighth of a mile from a house.

B. REPRODUCTIVE SUCCESS

One or more eggs were removed from nests 1 to 5 on May 7 at the request of the Canadian Wildlife Service for analysis for pesticide residues (results not yet released).

Nest Site 1: Found with four eggs on May 2. An egg was collected on May 7 leaving three eggs. On June 10 one young bird aged 3-4 days was in the nest with two unhatched eggs; these were collected. The one young bird was half grown on June 19 and it had left the nest when it was last seen on July 13. On August 13 no birds were seen at the site.

Nest Site 2: Found with five eggs on May 7; one egg was collected. On June 5 there were four young birds 2-3 days old. They were more than half

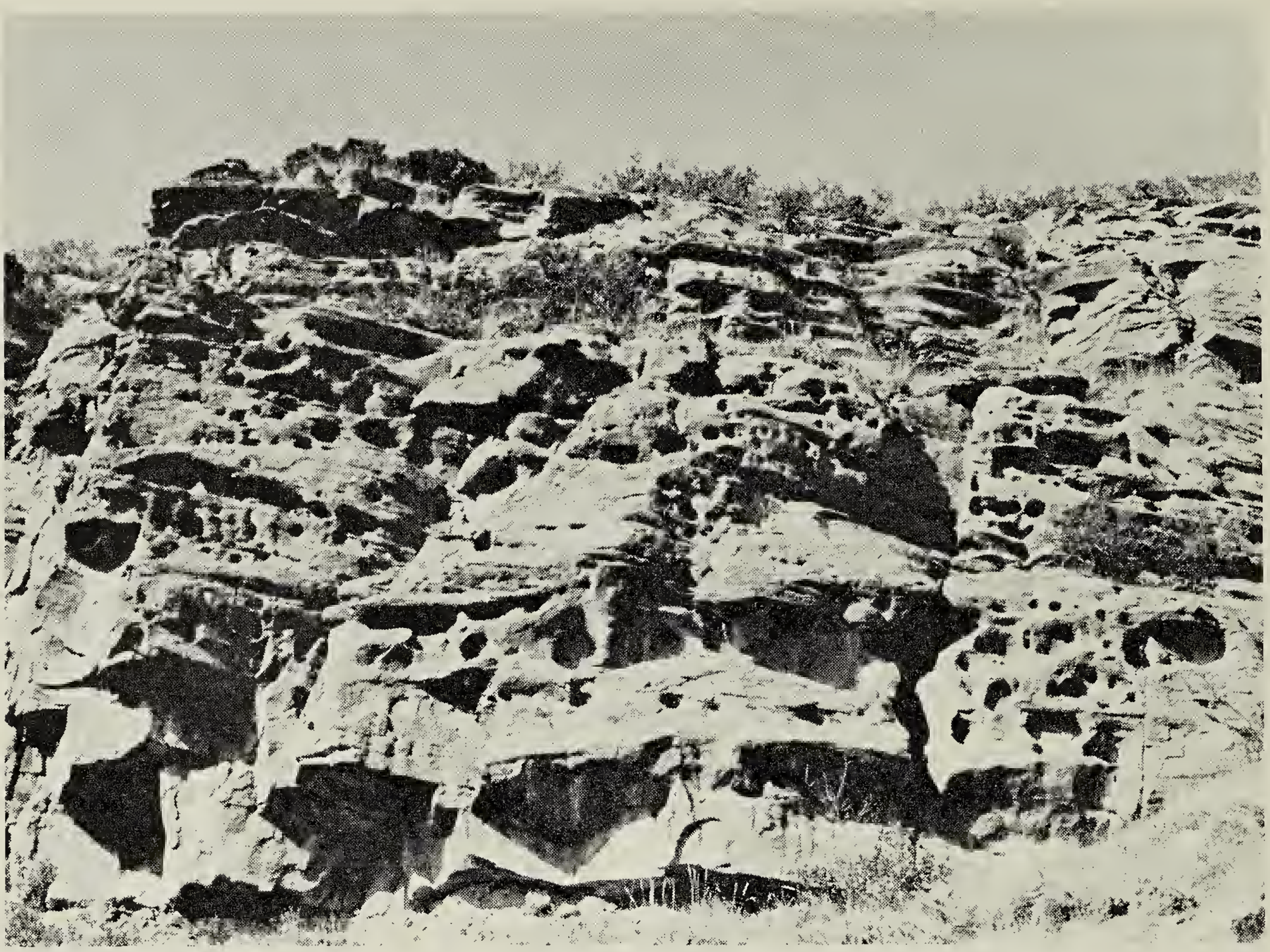

Fig. 2 — Nest site no. 4; the wind-eroded hollows preferred by Prairie Falcons.

grown on June 19 and were fully grown on June 29, when they were still on the nesting ledge. Two weeks later on July 14, three young birds were present and defended the area by stooping at the observer.

Nest Site 3: Found with five eggs on April 26. An egg was collected on May 7. On June 5 there were four young birds 2-3 days old. On June 21 only two, half-grown, young were seen. On July 13, two young birds were present with the parents, and the young birds joined with the adults in stooping at the observer. A month later on August 13, no birds were seen at the site.

Nest Site 4: Found with five eggs on April 26. An egg was collected on May 7 leaving four eggs. On May 20 there were only two eggs in the nest, and on June 5 only one egg remained; this was collected. This clutch was the only complete failure among the eight eyries.

Nest Site 5: Found with five eggs on April 26. An egg was collected on May 7, leaving four eggs. On June 12 there were four downy young in the nest. On June 29 these were half grown. On July 13 only one young bird was seen, and it was fully grown and flying. On August 13 no birds were seen at the site.

Nest Site 6: Found with four eggs on May 12. On June 11 there were four downy young in the nest. On June 20 the four young were quite aggressive. On July 2 two fully fledged young were seen. On August 13 there were no birds at the site.

Nest Site 7: Found with three young on June 20. These were fully grown and still on the nesting ledge. Five days later, on June 25 the three young birds were flying. Three weeks later on August 14, there were no birds at the site.

Nest Site 8: Found with two young on June 27, these birds were already flying. On August 14 there were no birds at the site.

Summary

Six nests with clutches were found between April 26 and May 12. Of these, four had clutches of five eggs, and two had clutches of four eggs. The average clutch size was 4.7.

In two nests eggs disappeared, apparently naturally, or failed to hatch. In Nest 1 two eggs did not hatch. In Nest 4 two eggs disappeared after one had already been collected and later a third egg disappeared. Since the nest was by then abandoned the last remaining egg was also collected. The loss of eggs in this nest either followed desertion caused by the initial visit of the observer, or was associated with the fact that there was no male observed at the site during any of the four visits.

The removal of an egg from each of the clutches of eggs meant that in none of the nests studied was there ever more than four young, so it is not known if the parents would have been under duress if they had had to feed five young in 1967, which was a dry summer.

Hatching occurred in the last few days of May and the first 10 days of June. At Nest 2 hatching occurred about June 2-3, at Nest 1 it occurred about June 6-7, and at Nests 5 and 6 about June 9-11.

There seems to have been some natural losses of young from the nest. In Nest 3 only two of four young hatched reached the half-grown stage. In Nest 5 only one flying young was observed from four young present at the half-grown stage. In Nest 6 only two young became fully grown from four young present at the half-grown stage. Thus of 12 young hatched from 12 eggs, two young died before they were half-grown and up to five more apparently died after that stage, leaving a minimum of only five flying young from 12 eggs hatched. A further indication of poor fledging is indicated by the two nests found only after the young had hatched. These produced only five flying young, an average of 2.5 young per nest.

Young were full grown as early as June 20 (Nest 7) and were first observed flying on June 25 (Nest 7). Young were last seen in the nest on July 2 (Nest 6). Young birds were still defending the site by stooping as late as July 14 at more than one nest.

C. FOOD

Table 2 lists some of the prey species found in the nest. The nest site was cleared after each visit as far as possible so that the samples collected at the next visit would be reasonably new. In the short time I was at each nest I took fresh pellets, a sample of other pellets and any easily identifiable remains. The table does not, therefore, pretend to present a quantitative analysis, but it nevertheless shows the relative proportion of birds to mammals that were being used as food during each month of the breeding season.

TABLE 1: RELATIVE POSITIONS OF THE EYRIES

Site No.	Length of talus slope below cliff foot*	Height above foot of cliff*	Distance below crest of cliff*
1	75	15	10
2	35	15	12
3	30	10	7
4	25	25	10
5	120	10	7
6	300	15	10
7	110	15	8
8	30	30	5
Average	90.6	16.8	8.6

*Dimensions in feet

TABLE 2: FOOD ITEMS COLLECTED

BIRD	April	Nest Site
W. Meadowlark breast-feathers	26	3
6 pellets (small birds)	26	3
Robin breast-feathers	26	4
Gray Partridge breast-feathers	26	4
sparrow (sp.?) primaries	26	5
Clay-colored Sparrow secondaries	26	5
Horned Lark secondaries	26	5
longspur (sp.?) wing and tail feathers	26	5
	May	
sparrow (sp.?) primary	2	1
longspur (sp.?) wing feathers	7	1
1 pellet (medium-sized bird)	12	6
3 pellets (small birds)	29	1
	June	
Robin beak, foot and leg bone	5	2
3 pellets (sp.?)	5	2
sparrow primaries (sp.?)	5	2
1 pellet (sp.?)	5	3
Robin primaries	12	6
sparrow primaries (sp.?)	12	2
pellets (bird sp.?)	12	2
Magpie primaries	12	5
primaries (small bird sp.?)	19	1
Horned Lark (wing coverts)	19	1
3 pellets (bird sp.?)	19	1
Robin remnants	19	1
sparrow primaries (sp.?)	19	2
Goldfinch 1 pellet	19	2
Franklin's Gull wing	29	5

MAMMAL	April	Nest Site
3 pellets (field vole)	26	3
Fur (field vole)	26	4
	May	
2 pellets (ground squirrel)	12	6
	June	
3 pellets (ground squirrel)	5	2
remnants (ground squirrel)	5	2
3 pellets (ground squirrel)	5	2
remnants (ground squirrel)	11	6
pellets (ground squirrel)	12	6
hind leg (ground squirrel)	12	5
3 pellets (ground squirrel)	19	2
limb and jaw bones (ground squirrel)	20	6
4 pellets (ground squirrel)	20	6
4 pellets (ground squirrel)	21	5
limb bones (ground squirrel)	21	5
remnants (ground squirrel)	25	7
hind end (ground squirrel)	29	2
hind end (ground squirrel)	29	5

Summary

As is shown by Table 2 the proportions of birds and mammals changed from month to month. Some meadow vole (*Microtus* sp.) pellets were found in nest sites 3 and 4 on initial visits, but these were the only meadow vole samples recorded. This suggests that they can constitute a part of the falcon's diet in the absence of birds and ground squirrels. Richardson's ground squirrels *(Citellus richardsonii)* did not appear in the samples before May 12. Bird samples predominated until the end of the first week in June when the young started to hatch. Ground squirrels then became the prey most widely taken, though at Nest

Site 2 birds continued to be a major food item all through June. At Nest Site No. 1 the adults did not switch to ground squirrels at all. This pair seemed to have specialized in birds since no mammal remains were found at the nest. It is possible that the fact that two of their eggs did not hatch is related to this, but this will not be known until the eggs are analysed.

Why adult Prairie Falcons did not take ground squirrels more often for their own use in May is not clear, but it is interesting that they preferred to feed them to their young. (Some ground squirrel prey samples were also frozen for analysis).

CONCLUSION

This paper describes the position of eight Prairie Falcon eyries in southern Alberta in 1967, success of these nests, and the food remains found at the nest. Eyries were closer to the top of the wind-hollowed sandstone cliffs used, than to the bottom. Birds appeared to be the food favored by the adults. After the eggs began to hatch ground squirrels became the predominant food item brought to the nest.

In 1966 an average of four young was found in eight eyries visited in the second half of June. In 1967 the fledging success was very much less than this. It is not thought that my visits to the nests played any part in reducing reproductive success since young flew successfully from seven of the eight nests studied. May and June of 1966 were wet months whereas in 1967 they were comparatively dry. Presumably this might be expected to bring about some differences in the food available to the Prairie Falcons in the two years. It is not known yet whether the eggs being laid by these pairs of Prairie Falcons contained appreciable quantities of pesticide residues. But it is of some interest that, at least in 1967, these birds (like Peregrine Falcons) were eating numbers of birds early in the breeding season. Whether there is any cause and effect relationship between the food eaten and the weather, or between the food eaten and poor survival of the young remains to be determined by comparative studies in ensuing years.

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PRAIRIE NEST RECORDS SCHEME

Contributors are reminded to send 1968 nest record cards to Dr. Robert W. Nero, Prairie Nest Records Scheme, Manitoba Museum of Man and Nature, Winnipeg 2. If you have not previously contributed to the scheme but are interested in keeping records of individual nests or colonies of nests, write to Dr. Nero for information and nest record cards.

BIONOMIC NOTES ON THE SATYRID BUTTERFLY Oeneis macounii AT RIDING MOUNTAIN, MANITOBA

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The Macoun's Arctic Butterfly, *Oeneis macounii* (Edwards), like some others in its genus, has a two year life cycle and flies only in alternate years. From Riding Mountain westward it flies in odd-numbered years, while to the east it flies in even-numbered years. We observed (Masters *et al*, 1967) that the habitat of this butterfly in Minnesota and eastern Manitoba is open jack pine forest. Both sexes, which were captured in almost equal numbers, could be distinguished from a distance while on the wing because of differences in flight behaviour. Females fly slowly and aimlessly through the pine forest and are readily netted. Males, more active and harder to capture, select favourite perches that serve as observation points over small clearings, and from such vantage points they wait for a female and drive away other males that come into view. When a territorial male is captured, he will often be replaced by a new male in an hour or two, the latter frequently using the same perch. Both sexes were observed to land in sunlit spots with wings open; only infrequently would one close its wings.

We now have some further observations of this species at Riding Mountain where it was again found in open jack pine forests, though favouring higher points along ridges. Males preferred small sunlit openings in the forest or along trails; females, on the other hand, ranged more widely and sometimes were captured at a distance

Forest clearing, Riding Mountain, Manitoba —typical habitat for *Oeneis macounii.*

from the pines—one was found in the middle of a large field.

Our observations were made over a three day period with three correspondingly different weather conditions. On June 23, a cold, cloudy day with the temperature never exceeding 55°F., no *macounii* were seen to fly and the only ones located were hanging on the undersides of leaves near the ground—one copulating pair was found in this situation. On June 24, with a clear sky and the temperature reaching 68°F., butterflies were active and always landed in sunlit areas with their wings open. On June 25, quite hot for Riding Mountain at 80°F., the butterflies were still active but after alighting they would quickly fold their wings over their backs and would sometimes lean slightly away from the sun. These behavioural differences are related to thermoregulation, a subject taken up in detail by Clench (1966). Clench cites the importance of thermoregulation to butterfly behaviour and concludes that the opening and closing of wings is one of several devices that permit control of the amount of solar heat received, the wings being the butterflies' primary area for heat exchange. Clench cites six distinct heat zones for butterfly activity:

1. *Lethal heat* (limits unknown, probably well over 100°F).
2. *Cooling dominant.* Normal activity suspended; cooling activity only (90°F and over; upper limit not known).
3. *Normal activity.* Feeding courtship, mating, active flight, etc. This has three subdivisions:
    - A. Normal activity combined with auxiliary cooling (*circa* 85-90°F).
    - B. Vernier control (*circa* 75-85°F).
    - C. Normal activity combined with auxiliary heating (*circa* 68-75°).
4. *Warming dominant.* Basking the major activity (*circa* 58-68°F).
5. *Inactive* (below 58°F, lower limit unknown).
6. *Lethal cold* (boundary value unknown).

Oeneis macounii.

Our observations with *O. macounii* correlate rather well with Clench's data if the temperature values are adjusted to slightly lower temperatures. For other *Oeneis*, such as *O. alberta* Elwes (Brown, 1952) the temperature values seem to be significantly lower.

Huber (1965) observed two *macounii* alighting with closed wings and angling towards the sun and interpreted this as a method of concealment rather than thermoregulation. We observed *macounii* alighting on rocks only infrequently, though they did then close their wings and once one leaned slightly away from the sun. Listing in the sun was the subject of an early paper by Longstaff (1908) who observed other satyrid butterflies, including the closely related European *Satyrus semele* (Linnaeus). Longstaff observed that satyrids would sometimes list (lean to one side) while sitting with folded wings; he then demonstrated that this cannot be a function of concealment because the angle of the list is too small to hide the shadow, which in most cases was actually lengthened. Dr. Longstaff, who was concerned primarily with mimicry and protective behaviour, concluded that "So far as regards the shadow cast, no list from the sun can be protective to the insect unless it be extreme. Again, a list from the sun by resulting in the maximum illumination of the wing surface, can hardly aid concealment, at the same time, it cannot be denied that a butterfly by placing itself out of the upright, may thereby be protected in so far as it may then be more difficult to detach it from its surroundings." Dr. Longstaff rejected the concealment theory, but did not have an alternative for it, such as we now have, based on thermoregulation. It is not plausible that concealment would be a temperature regulated activity (i.e. occurring only above 80°F), and, in spite of the cryptic undersides of *macounii*, concealment during the active flying hours appears not to occur.

Territorialism in *O. macounii* appears to function for the purpose of acquiring a mate (Masters, *et al* 1967). A territory usually consists of a small glade in which the male has a strategic perch from where he can observe the entire area. The butterflies have definite instincts regarding special orientation in a glade as pertains to selecting an ideal perch. If you remain stationary in a glade, the butterflies will become quite unaware of you and can be observed at close range. Several times we (JHM) observed that a particular butterfly would alight again and again on a particular perch. It seemed a simple matter to move a camera and tripod into the glade to focus on this perch and wait; however, the presence of observer and camera seemed to alter the topography of the clearing from the butterfly's point of view and another perch would be selected—most frequently closer to the new obstruction in the clearing and too close for the camera to focus on it. One butterfly, that had been observed for some time, was captured and allowed to be replaced by another male; the habits of the replacement and his selection of perches were almost identical with those of his predecessor. Selection of a favoured perch was apparently also dependent upon the angle of the sun; therefore, in any particular glade the favoured perch would vary during the day. This seemed to be more dependent upon changing shadows in the glade that provided better vision from one spot rather than upon thermoregulation. The nature of the favourite perch did not seem to be as important as its location. Most often it was among green leaves on a tree branch or at the top of a low bush, but frequently it was on a bare twig. Males occasionally alighted on fallen logs, rocks or bare earth, but only momentarily and they quickly returned to a higher perch.

Feeding seemingly played a minor role in *macounii's* daily behaviour. Regularly used glades usually contained a few flowers which were visited for brief periods throughout the day, although each time the butterfly would then quickly return to its favourite perch on a tree or shub.

Acknowledgements

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A PRELIMINARY BOTANICAL INVESTIGATION OF WRITING-ON-STONE PROVINCIAL PARK IN SOUTHERN ALBERTA

by **B. de Vries,** Fort Qu'Appelle, Saskatchewan

INTRODUCTION

Writing-on-Stone Provincial Park is located in southern Alberta in Township 1, Range 13, West of the 4th Meridian. It is approximately five miles north of the International Boundary and covers all of section 35 and parts of section 36, straddling the Milk River. The park has an area of approximately one and one-quarter square miles, consisting mainly of the sandstone cliff formations of the Milk River Valley and mixed-grass prairie (Fig. 1). It lies well within the semi-arid region of the mixed grasslands and Brown Soil Zone of the Canadian Midwest. The climate is continental with extremes in temperature and precipitation. Trees and shrubs are mainly found along the river bank and streams, and in sheltered locations. The generally steep slopes and high insolation limit the flora to relatively few species. A Cordilleran element might be expected in the park, due to the proximity of the Rocky Mountains, the Cypress Hills, and the Sweet-Grass Hills in northern Montana.

I carried on field work in the park during parts of June and July, 1964 and again in August 1965 and July 1967, during which time 202 species of vascular plants were collected. Areas subject to relatively frequent or extensive disturbance, caused by human activity, or by flooding due to beaver dams, were studied only superficially. The present study describes the existing vascular flora of the park, which, to the best of the writer's knowledge, has not previously received detailed investigation. A few small collections have been made in recent years by Dr. B. Boivin, Department of Agriculture, Ottawa, and by Mr. J. J. Sexsmith, Research Station, Lethbridge (personal communication).

ACKNOWLEDGEMENTS

The field work was supported by the Department of Lands and Forests, Edmonton, Alberta. Grateful appreciation is extended to Dr. B. Boivin, Department of Agriculture, Plant Research Institute, Ottawa, who examined many of the specimens. Special thanks are due to Dr. H. S. Armstrong, President, The University of Calgary, Dr. D. R. Moir, Department of Botany, Brandon University, and Dr. R. T. Ogilvie, Department of Biology, The University of Calgary, for their encouragement and assistance in carrying out this study. I am further indebted to Mr. M. Smoliak, Range Management Specialist, Canada Department of Agriculture, Research Station, Lethbridge, Alberta, and Mr. Hugh A. Dempsey, Archivist, Glenbow Foundation, Calgary, for their valuable information. I wish to thank Mr. and Mrs. George Yeager, Superintendent of the Park, for their kind co-operation, and my wife for her invaluable assistance in collecting specimens.

STUDY AREA

Geology and Topography

In general, the topography of southern Alberta, including Writing-on-Stone, is undulating to rolling with deep, eroded river valleys and elevations up to 3500 feet. The upland prairie of the park area has been deeply eroded by the Milk River and transformed into a broad, relatively flat valley with numerous tributary coulees, in which the waters flow southward to join the Missouri River System.

A conspicuous feature of the park is the exposed sandstone formation known as the Milk River Formation of Mesozoic age. This formation is

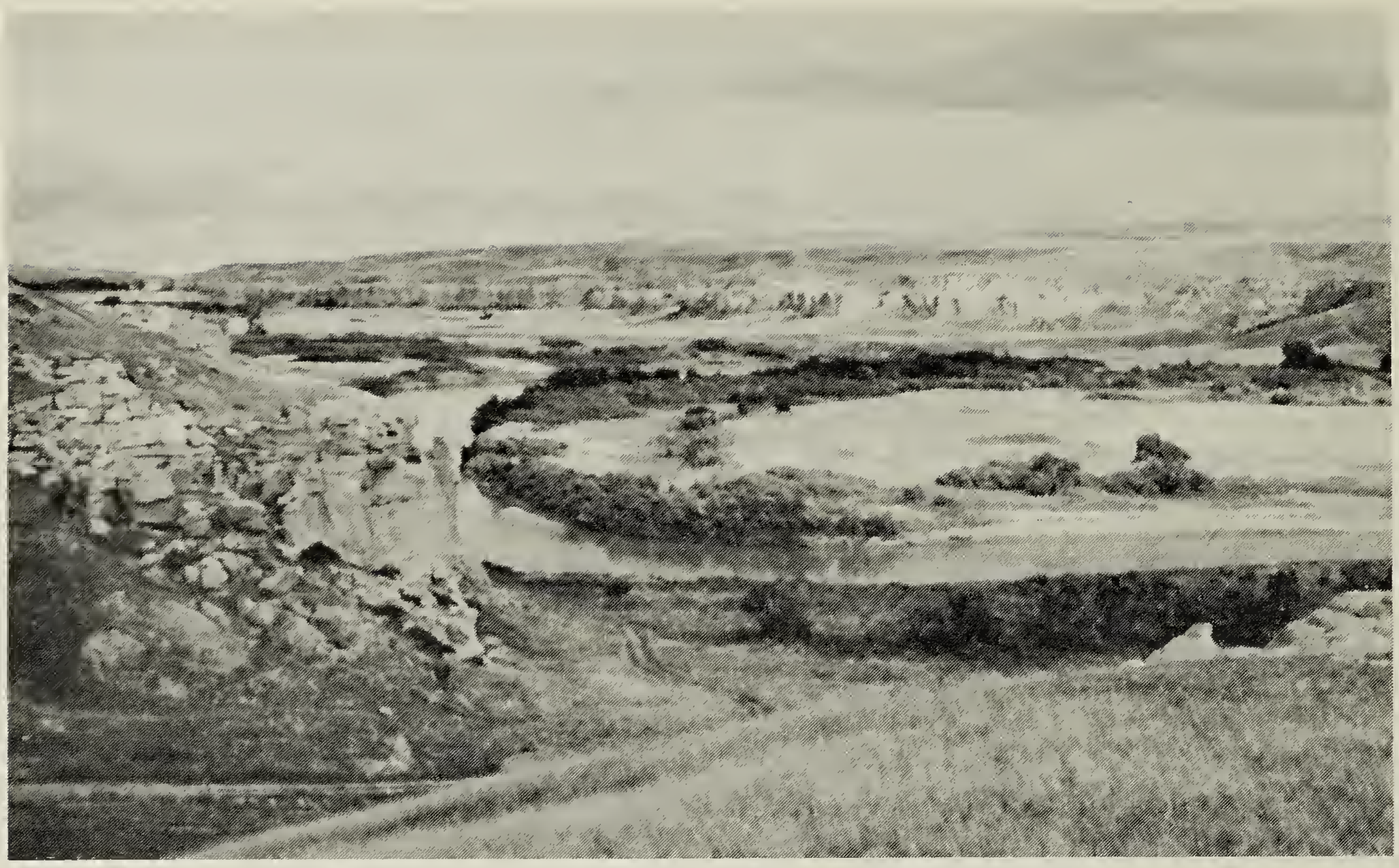


Fig. 1 — Southeast view of Writing-on-Stone Provincial Park, taken from collecting locality #5, showing the sandstone formations, the Milk River, and the alluvial flat. Shrubs along the river banks are mainly *Salix sp.*, while grasses in the foreground belong to the *Stipa-Bouteloua-Agropyron* association.

sharply divided into lower and upper layers which are readily seen on the sculptured cliffs. The upper zone is argillaceous sandstone and sandy shale with noticeable interbedded lenticular sandstone, while the lower zone is mainly sandstone composed of shaly sandstone and sandy shale in the lowest part (Russell, 1937). These castellate sandstones do not occur outside the immediate neighborhood of the Park because they are somewhat older than the familiar Upper Cretaceous Bearpaw and Belly River formations and although of Upper Cretaceous age have been exposed by surface erosion of the Sweet Grass arch. This arch dips north carrying the sandstones beneath surface away from the Milk River.

The surface soils of the region which are represented in Writing-on-Stone Park have been formed from glacial till derived from native sandstones and shales and form part of the Brown Soil Zone. In the park the surface soils are mainly sandy loam on the upland prairie, while alluvial clays, gravel and sand are found in the river valley. Soil erosion is evident along steep banks of coulees and in areas known as "Badlands." Erosion is fairly rapid and moisture penetration slight, producing highly unfavorable conditions for the development of either a plant cover or normal soil profile.

Climate

The following notes of the regional climate of the area in which Writing-on-Stone Park is situated, have been abstracted from Clarke *et al.* (1943), Hargrave (1949), Peters (1955), Thomas (1963), and Campbell *et al.* (1962). The climate of the mixed-grass region of southern Alberta is continental in character with low precipitation and great extremes in temperature. The following values are given for the Range Experiment Farm at Manyberries, approximately 53 miles east of the park: mean annual precipitation over a 32-year period 12.0 inches; mean annual temperature for the same period of time 40.3°F. The mean annual evaporation during this period was 30.6 inches. West of the park, the meteorological station at

Kippenville lists a mean annual precipitation over a 21-year period of 13.13 inches.

The amount of precipitation varies widely from year to year, ranging from 7.62 inches to 18.06 inches. The prevailing winds are northwesterly, and in winter dry, warm chinooks are experienced. Frequent high winds are recorded through most of the year. Due to great variation in the topography of the park, local variations in the general climatic pattern might be expected.

PLANT COMMUNITIES

Since little is known of the vascular flora and the ecology of the park, a brief consideration of the more important plant communities and their relevant ecology is of value.

The vascular flora of the area of which the park is an integral part, conforms in part to the mixed-grass association of Coupland (1961) and Campbell *et al.* (1962). The communities described here are based upon Coupland's interpretation of climax and seral stages. In areas of varied relief several scattered climatic-climax and preseral communities occur. Pronounced steepness of slope acts as an arresting factor, preventing the presere from developing into a climatic-climax by preventing soil accumulation and the consequent establishment of a ground cover.

Preseral communities were also observed on recently exposed areas such as mudbanks and on periodically inundated riverflats. They were also noted in areas of human activity. A youthful invading vegetation was often seen in these areas, but due to the instability of the environment, this has been prevented from developing into climatic-climax communities. Ecotones were often obscure due to interdigitation of habitats as a result of contrasting soil conditions. Sharp community boundaries occurred where great contrast existed in topography, moisture availability, and degree of human interference.

The mixed-grass prairie comprises several plant communities, each distinguished by one or more grasses commonly associated with certain soil characteristics. Communities on the periodically inundated river flat and "Beaver meadows" were not studied in detail due to lack of time. Some communities were characteristic of the landscape, while others were a minor element. The following more important types are described in this paper.

Stipa-Agropyron-Koeleria association — well developed soils of intermediate texture on upland prairie

Stipa-Bouteloua-Agropyron association—loam and sandy-loam soils of the drier upland prairie

Agropyron consociation — alluvial soils

Stipa-Agropyron-Koeleria Association (Fig. 2)

The most abundant grass in this community type is *Stipa comata.* Other important grasses in order of declining abundance are: *Agropyron smithii, Agropyron cristatum, Koeleria cristata,* and *Carex filifolia.* Principal herbs are *Artemesia frigida,* and the prostrate shrub *Rosa arkansana.* The dwarf club-moss *Selaginella densa* is often a monodominant.

Considerable variation in composition of the mixed-grass association results from frequent topographical and soil differences. On areas of eroded soil *Agropyron smithii* is the dominant species. *Stipa spartea* var. *curtiseta, Stipa viridula,* and *Agropyron trachycaulum* characterize the deeper soils with more favourable moisture conditions.

Constant erosional forces in the "Badlands" prevented formation of a closed ground cover, and an extremely sparse vegetation evolved. Xerics such as *Gutierrezia sarothrae* and *Hymenoxys richardsonii* are characteristic. The prostrate shrub *Juniperus horizontalis* is also commonly found. *Opuntia polyacantha* and *Sphaeralcea coccinea* are often characteristic monodominants in the community, where native ground cover has been severely damaged.

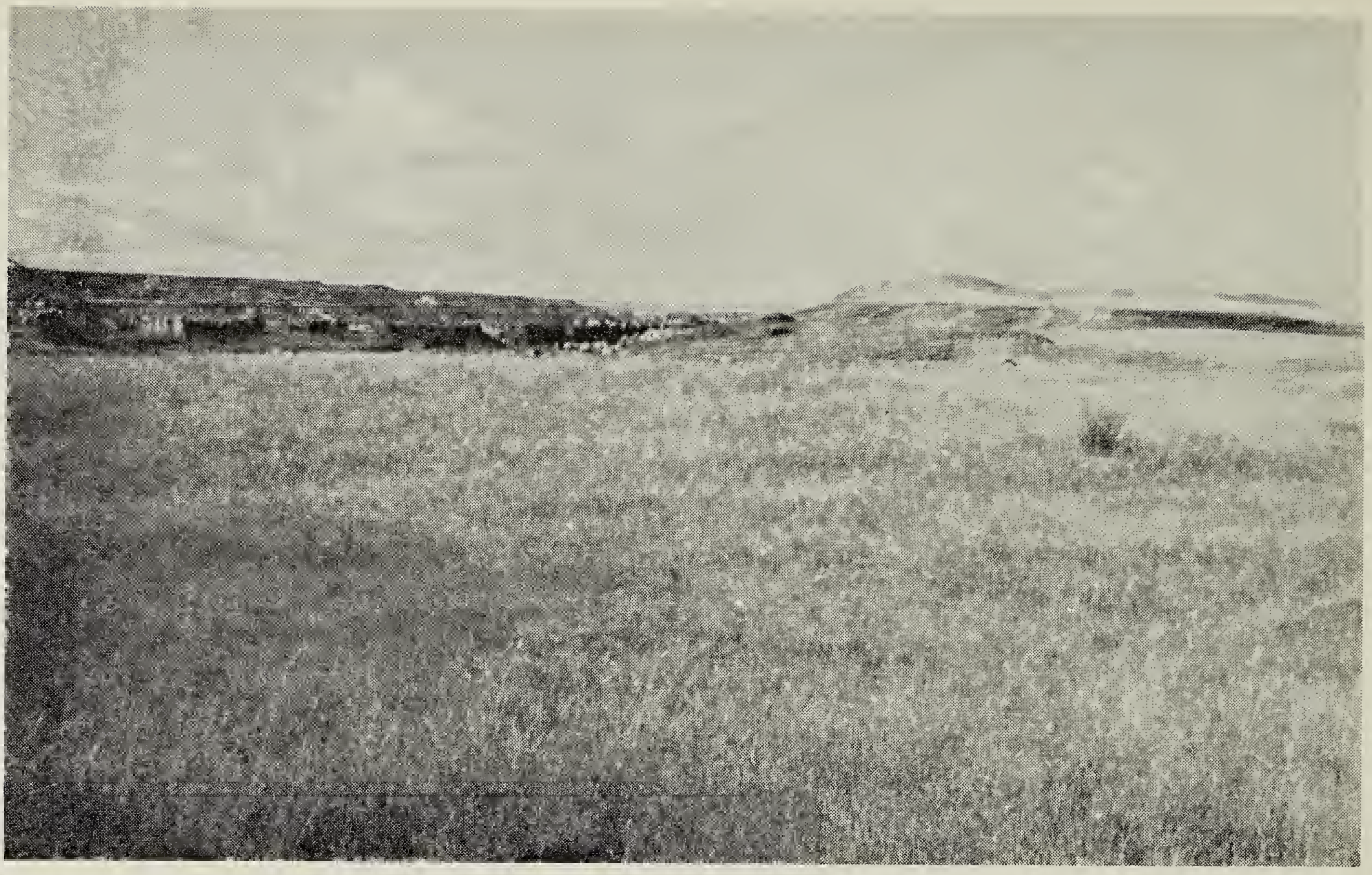


Fig. 2 — Westerly view of Writing-on-Stone Provincial Park, taken from collecting locality #4, towards Lookout Butte. In the foreground a *Stipa-Agropyron-Koeleria* association on the upland prairie.

Stipa-Bouteloua-Agropyron Association

This association differs from the preceding by a close affinity to the more xeric loam and sandy-loam areas of the upland prairie and open slopes. The characterstic dominant is *Bouteloua gracilis* with such co-dominants as *Stipa comata* and *Agropyron smithii.* Lesser components of the association are *Koeleria cristata* and *Carex filifolia.* Characteristic associations are such grasses as *Calamovilfa longifolia Muhlenbergia cuspidata, Agropyron cristatum,* and the following herbs in decreasing order of abundance, *Artemisia frigida, Antennaria nitida, Antennaria parvifolia,* and *Astragalus pectinatus.* Common shrubs of open slopes are *Juniperus horizontalis* and *Artemisia cana.*

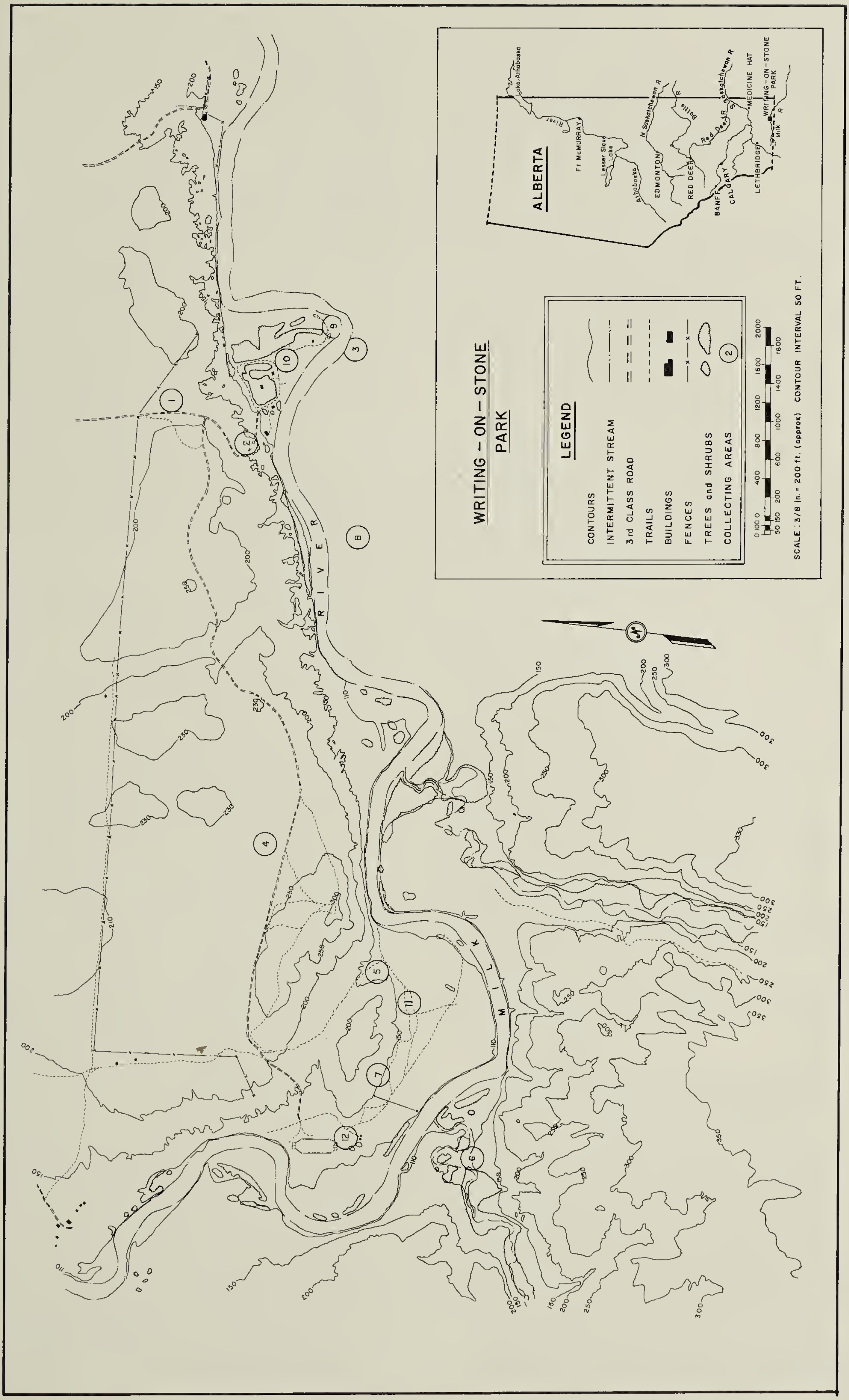
Agropyron Consociation

Agropyron smithii and *Agropyron trachycaulum* are the dominants of the consociation, occurring chiefly on the river flat. The drier areas here tend to be dominated by *Agropyron smithii,* while areas of higher soil moisture content support *Agropyron trachycaulum* as the characteristic species.

Minor community types are noticed on the periodically inundated river flats and stream banks. *Calamagrostis inexpansa* tends to be the dominant, while lesser components of the community are *Elymus canadensis, Poa compressa,* and *Sphenopholis obtusata.* Soils of high moisture content support a principal vegetation cover of *Eleocharis palustris, Scirpus americanus, Juncus balticus,* and *Juncus nodosus,* with such herbs as *Mentha arvensis* and *Glycyrrhiza lepidota.* Shrubs such as *Symphoricarpos occidentalis, Salix interior,* and *Salix amygdaloides* occur along coulee bottoms and on river and stream banks. Trees are uncommon but for *Populus sargentii,* which is found locally on low alluvial areas and along river banks.

EFFECT OF HUMAN ACTIVITIES ON THE FLORA OF THE PARK

The following notes on the history of the park have been abstracted from Campbell (1959), Dewdney (1964), and Bryant *et al.* (1964). The earliest inhabitants of the area in which the


WRITING - ON - STONE PARK
LEGEND
CONTOURS
INTERMITTENT STREAM
3rd CLASS ROAD
TRAILS
BUILDINGS
FENCES
TREES and SHRUBS
COLLECTING AREAS
0 100 0 50 150 200 400 600 800 1000 1200 1400 1600 1800 2000
SCALE : 3/8 In. = 200 ft. (approx) CONTOUR INTERVAL 50 FT.
ALBERTA
Lake Athabaska
River
Ft McMURRAY
Lesser Slave Lake
Athabaska
N Saskatchewan R
EDMONTON
Battle R
RED DEER
Red Deer R
S Saskatchewan R
BANFF
CALGARY
LETHBRIDGE
MEDICINE HAT
WRITING - ON - STONE PARK
Milk R
MILK RIVER
1
2
3
4
5
6
7
9
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12
B
110
150
200
210
230
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330
350

park is situated were Indian tribes. The first record of European man in the area was in 1855, when James Doty visited the site and saw the pictographs on the cliffs. A detachment of the Northwest Mounted Police maintained a post from 1887 to 1918 at what is now known as Police Coulee.

The area became a provincial park on August 31, 1935, but it was not until 1952 that development of tourist facilities, roads, etc., began. Writing-on-Stone Park, which was officially opened in 1957, is not a major tourist attraction, but is widely used by local residents as a recreation area.

As a result of human activities, several plant species have been introduced to the park. At campsites and on disturbed areas for example, such plants as *Agropyron cristatum, Bromus inermis, Nepeta catarica, Trifolium repens, Plantago major, Lactuca serriola,* etc., are commonly found.

Most aliens are confined to such man-made habitats, but some seem to have become naturalised and are spreading e.g. *Polygonum convolvulus, Rumex fennicus, Chenopodium album, Salsola kali* var. *tenuifolia, Sisymbrium altissimum, Medicago sativa, Melilotus* spp., *Cirsium arvense, Tragopogon dubius,* etc.

A few indigenous species such as *Thermopsis rhombifolia, Sphaeralcea coccinea, Orthocarpus luteus, Artemisia frigida,* and *Helianthus petiolaris*, are also spread by human influence and are often conspicuous along roadsides.

ANNOTATED CATALOGUE OF THE VASCULAR FLORA

The following catalogue contains taxa of vascular plants collected by the writer. Additional specimens collected by Dr. Boivin and Mr. Sexsmith are indicated. One taxon, *Parietaria pensylvanica,* unreported by Moss (1959), is assumed to be a new entity in the flora of Alberta.

Three taxa, *Heuchera flabellifolia, Delphinium nuttallianum* and *Solidago missouriensis var. extraria* are believed to be a Cordilleran element in the park. These species were collected at elevations over 3400 feet and have been observed by the writer in similar habitats at low elevations in the mountains of southwestern Alberta.

The nomenclature is after Moss (1959) except where synonyms are cited. Except as otherwise stated all specimens have been collected and identified by the writer. Critical specimens have been examined or identified by Dr. B. Boivin. Specimens have been deposited in the herbaria of the Canadian Department of Agriculture, Plant Research Institute, Ottawa (DAO), the University of Calgary, Calgary, Alberta (UC), and that of the writer. All of the writer's collections reported here, with the exception of localities 3 and 8 (Fig. 3) were made within the boundaries of the park. The collection numbers cited are those of the writer.

COLLECTING LOCALITIES

Mixed-grass prairie and dry slopes

1. Mixed grasslands and upper slopes in the vicinity of the northeast entrance to the park.
2. Eroded areas among the sandstone formations along the main road leading into the park.
3. Dry north-facing slopes south of the Milk River outside the Park boundary.
4. Mixed grasslands of the upland prairie.
5. Roadsides and exposed south-facing slopes.

Alluvial flat and stream banks

6. Lower slopes of sheltered ravine south of the Milk River near Stony Coulee.
7. Lower slopes north of the Milk River.
8. Alluvial flat south of the Milk River outside the park boundary.
9. River bank south of the main campsite.

Disturbed habitats

10. Waste areas and cultivated grounds of the main campsite.
11. Disturbed roadsides.
12. Disturbed areas near the sports grounds.

LIST OF SPECIES

EQUISETACEAE

Equisetum arvense L. Common on moist alluvial flat, 2760 (DAO).

Equisetum laevigatum A. Br. Locally on river bank and alluvial flat, 2730 (DAO).

SELAGINELLACEAE

Selanginella densa Rydb. Subdominant species common on dry eroded areas on prairie, 2150 (UC). Also found on dry upper slopes, 2795 (DAO).

POLYPODIACEAE

Cystopteris fragilis (L.) Bernh. Locally common in thickets at base of cliff on dry slope, 3277 (UC).

PINACEAE

Juniperus communis L. var. *depressa* Pursh Common semi-prostrate shrub of dry slopes, 2670 (DAO).

Juniperus horizontalis Moench Common on dry slopes, 2671 (DAO). Also common on dry sandstone ledges, 2174 (UC).

GRAMINEAE

Agropyron cristatum (L.) Gaertn. Common on dry upland prairie, 2778 (DAO).

Agropyron smithii Rydb. Common on dry prairie and slopes, 2782 (DAO). Also common on dry alluvial flat, 2797 (DAO).

Agropyron trachycaulum (Link) Malte Common on sheltered slope and damp upland prairie, 2803 (DAO). Also common on low alluvial flat, 3501.

Agrostis alba L. Uncommon in damp places along river, 2798 (DAO). Also locally on moist alluvial flat, 2801 (DAO).

Bouteloua gracilis (HBK). Lag. Common on dry upland prairie, 2780 (DAO).

Bromus inermis Leyss. Introduced weed of cultivated areas, 2775 (DAO).

Bromus tectorum L. Locally abundant on dry slope near main road, 2187 (DAO, UC).

Calamagrostis inexpansa A. Gray Common along river bank and low alluvial flat, 2781 (DAO).

Calamovilfa longifolia (Hook.) Scribn. Locally common on sandy areas on upland prairie, 2776 (DAO). Uncommon on slopes, 2802 (DAO). Locally on alluvial flat, 2810 (DAO).

Elymus canadensis L. Locally on river bank, 2809 (DAO). Locally on alluvial flat, 2774 (DAO).

Elymus cinereus Scribn. & Merr. (*E. piperi* Bowden) Locally on river bank, 2796 (DAO).

Hordeum jubatum L. Locally abundant on alluvial flat, 2777 (DAO).

Koeleria cristata (L.) Pers. Common on dry sandy prairie, 2185 (DAO, UC). Also common on dry slopes, 2783 (DAO). Common on grasslands on alluvial flat, 2784 (DAO).

Muhlenbergia cuspidata (Torr.) Rydb. Common on dry slopes, 2800 (DAO).

Oryzopsis hymenoides (R. & S.) Ricker Locally common on dry slopes, 2779 (DAO). Local in dry sandy grasslands, 2188 (DAO, UC).

Poa compressa L. Locally in damp grasslands on alluvial flat, 2799 (DAO). Other species of *Poa* may have been overlooked.

Spartina gracilis Trin. (Collected by Sexsmith, June 17, 1962).

Sphenopholis obtusata (Michx.) Sribn. Locally in damp grasslands on alluvial flat, 2781 A (DAO).

Sporobolis cryptandrus (Torr.) A. Gray (Collected by Sexsmith, July 13, 1941).

Stipa comata Trin. & Rupr. Very common on dry upland prairie, 2838 (DAO).

Stipa spartea Trin. var. *curtiseta* Hitchc. Very common on dry upland prairie, 2189.

Stipa viridula Trin. Common in dry prairie grasslands, 2186 (DAO).

CYPERACEAE

Carex filifolia Nutt. Common on dry upland prairie and slopes, 2182 (UC).

Carex lanuginosa Michx. (*C. lasiocarpa* Ehrh. var. *latifolia* (Bock) Gleason) Locally common on river banks, 2808 (DAO).

Eleocharis palustris (L.) R. & S. Common on river banks, 2811 (DAO).

Scirpus americanus Pers. Common on river bank, 2804 (DAO).

JUNCACEAE

Juncus balticus Willd. var. *littoralis* Engelm. Common on river bank, 2805 (DAO).

Juncus nodosus L. Common on moist alluvial flat, 2806 (DAO).

LILIACEAE

Allium cernuum Roth Locally on open slopes, 2677 (DAO).

Disporum trachycarpum (S. Wats.) B. & H. Locally common in thickets at base of cliff on dry slope, 3273 (UC).

Fritillaria pudica (Pursh) Spreng. Local at base of open slope, 3713.

Smilacina stellata (L.) Desf. Local among thickets on alluvial flat, 2737 (DAO).

Zygadenus gramineus Rydb. Common on grassy slopes, 3233 (UC).

IRIDACEAE

Sisyrinchium montanum Greene Local on low alluvial flat, 2785 (DAO).

SALICACEAE

Populus sargentii Dode Common tree along river bank and on low alluvial flats, 2182 (UC).

Salix amygdaloides Anderss. Common shrub along river bank and streams, 2190 (DAO, UC).

Salix interior Rowlee var. *pedicellata* (Anderss.) Ball Common along streams in coulees, 2743 (DAO). Also common along river bank, 2744 (DAO).

Salix lutea Nutt. Locally in wet places on alluvial flat, 2191 (UC).

BETULACEAE

Betula occidentalis Hook. Locally common on alluvial flat, 2159 (DAO, UC).

URTICACEAE

Parietaria pensylvanica Muhl. (Collected by Boivin, 12271, June 27, 1958).

Urtica dioica L. var. *procera* (Muhl.) Wedd. (*U. gracilis* Ait.) Common in thickets on alluvial flat, 2674 (DAO).

SANTALACEAE

Commandra pallida A. DC. Common on upland prairie, 2703 (DAO).

POLYGONACEAE

Eriogonum cernuum Nutt. (Collected by J. H. Hudson, August 27, 1959).

Eriogonum flavum Nutt. Common on dry exposed areas on slopes, 2170 (UC). Also common on open areas on upland prairie, 2757 (DAO).

Polygonum aviculare L. Common along roadsides, 2791 (DAO).

Polygonum convolvulus L. Introduced and common species of cultivated and waste areas, 2679 (DAO).

Polygonum ramosissimum Michx. Common on sandy soil along roadsides, 2769 (DAO).

Rumex fennicus Murb. Introduced and well established species of low areas on alluvial flat, 2684 (DAO).

Rumex maritimus L. var. *fueginus* (Phil.) Dusen Common along river bank, 2708 (DAO).

Rumex venosus Pursh Common on dry sandy slopes, 2160. (DAO, UC), 2682 (DAO).

CHENOPODIACEAE

Chenopodium album L. Common weed along roadsides and in disturbed areas, 2715 (DAO).

Chenopodium fremontii S. Wats. (Collected by Boivin, 12272, June 27, 1958).

Eurotia lanata (Pursh) Moq. Common on heavy soils in eroded areas, 2650 (DAO).

Salsola kali L. var. *tenuifolia* Tausch. Very common introduced weed of dry disturbed areas on upland prairie, 2719 (DAO).

Sarcobatus vermiculatus (Hook.) Torr. Locally common shrub on alluvial flat, 2653 (DAO).

AMARANTHACEAE

Amaranthus retroflexus L. Common weed of waste places, 2654 (DAO).

NYCTAGINACEAE

Mirabilis hirsuta (Pursh) MacM. var. *linearis* (Pursh) Boivin Locally on dry slopes, 2767 (DAO). (Det.-Boivin, 1966).

CARYOPHYLLACEAE

Arenaria lateriflora L. Locally in thickets at base of cliff on dry slope, 3275 (UC).

Cerastium arvense L. Common on gravelly prairie and dry slopes, 3276 (UC).

Lychnis pudica Boivin (*L. drummondii* (Hook.) S. Wats.) Uncommon on dry slopes, 2710 (DAO). (Det.- Boivin, 1967).

Paronychia sessiliflora Nutt. Common on dry gravelly slopes and ledges, 2686 (DAO).

Silene menziesii Hook. Locally common among shrubs on alluvial flat, 2178 (DAO, UC). Also locally common on river bank, 2741 (DAO).

RANUNCULACEAE

Anemone multifida Poir. Common in sheltered locations on slopes, 2752 (DAO).

Anemone multifida Poir. var. *hudsoniana* DC. Locally common in sheltered locations on grassy slope, 3264 (UC).

Clematis ligusticifolia Nutt. Common vine in coulees and sheltered places on alluvial flat, 2735 (DAO).

Delphinium nuttallianum Pritz. Local but uncommon at margin of thickets on prairie grassland, 3259 (UC).

Ranunculus cymbalaria Pursh Common on wet river bank and alluvial flat, 2713 (DAO).

Thalictrum venulosum Trel. Locally common among thickets on alluvial flat, 2695 (DAO).

CAPPARIDACEAE

Cleome serrulata Pursh Locally common on dry sandy soil, 2678 (DAO).

CRUCIFEREAE

Descurainia pinnata (Walt.) Britt. var. *brachycarpa* (Richards.) Fern. (Collected by Boivin, 12277, June 27, 1958).

Descurainia sophia (L.) Webb (Collected by Boivin, 12275, June 27, 1958).

Erysimum inconspicuum (S. Wats.) MacM. Locally on dry slopes, 2161 (DAO, UC).

Lepidium densiflorum Schrad. (Collected by Boivin, 12282, June 27, 1958).

Lesquerella alpina (Nutt.) S. Wats. var. *spathulata* (Rydb.) Payson Common on dry prairie, 2165 (DAO, UC). Also common on dry slopes, 2180 (DAO, UC).

Lesquerella arenosa (Richards.) Rydb. (Collected by Sexsmith, July 13, 1941).

Rorippa islandica (Oeder) Borbas Locally common on moist river bank and alluvial flat, 2765 (DAO).

Sisymbrium altissimum L. Introduced and well established weed along roadsides, 2657 (DAO).

SAXIFRAGACEAE

Heuchera flabellifolia Rydb. Locally common on rocky ledge on dry slope, 3274.

Ribes aureum Pursh Locally common at base of slopes, 2156 (DAO, UC). Common on river bank, 2656 (DAO). Also locally common on alluvial flat, 2787.

ROSACEAE

Amelanchier alnifolia Nutt. Locally along river bank, 2747 (DAO).

Chamaerhodos erecta (L.) Bunge ssp. *nuttalli* (Pickering) Hulten Common on dry gravelly slopes and sandstone ledges, 2768 (DAO).

Geum triflorum Pursh Common on upland prairie, 2185 (DAO).

Potentilla anserina L. Common on low meadow on alluvial flat, 2720 (DAO).

Potentilla effusa Dougl. Locally common on grassy slope, 2162 (DAO, UC).

Potentilla hippiana Lehm. Locally common on dry upland prairie, 2793 (DAO).

Potentilla pensylvanica L. Common on dry upland prairie, 2792 (DAO).

Prunus virginiana L. Common small tree of sheltered locations on slopes, 2696 (DAO).

Rosa acicularis Lindl. Common in sheltered locations on slopes, 2166 (UC).

Rosa arkansana Porter Common on dry slopes and prairie, 2659 (DAO).

Rosa woodsii Lindl. Common on upland prairie and slopes, 2702 (DAO).

LEGUMINOSAE

Astragalus aboriginum Richards. var. *glabriusculum* (Hook.) Rydb. Local on prairie grasslands, 3461 (UC). Also occasional on river bank, 3292 (UC).

Astragalus bisulcatus (Hook.) A. Gray Common on grassy slopes, 2152 (DAO, UC).

Astragalus canadensis L. Locally common on alluvial flat, 2734 (DAO).

Astragalus drummondii Dougl. Locally common on dry slopes, 3224 (UC).

Astragalus kentrophyta A. Gray Uncommon on dry eroded slopes, 2169 (DAO, UC).

Astragalus missouriensis Nutt. Common on slopes, 3229 (UC).

Astragalus pectinatus (Hook.) Dougl. Common on upland prairie, 2718 (DAO).

Astragalus purshii Dougl. Common on dry slopes, 2764 (DAO).

Astragalus striatus Nutt. Common on dry slopes, 2672 (DAO). Also common on dry upland prairie, 2167 (UC), and along roadsides, 2673 (DAO).

Astragalus tenellus Pursh Common on dry slopes, 2172 (DAO, UC). Local on dry alluvial flat, 2705 (DAO).

Astragalus triphyllus Pursh Common on dry slopes, 2688 (DAO).

Glycyrrhiza lepidota (Nutt.) Pursh Common along river bank and on alluvial flat, 2832 (DAO).

Hedysarum boreale Nutt. var. *boreale* Common on dry slopes, 2753 (DAO). Local on sandstone ledges, 2168 (DAO, UC).

Hedysarum boreale Nutt. var. *cinerascens* (Rydb.) Rollins Locally common on dry slopes, 3232 (UC), 3460 (UC).

Lupinus argenteus Pursh Locally common on dry slopes, 2727 (DAO).

Medicago sativa L. Introduced and very common weed along roadsides and on cultivated areas, 2724 (DAO).

Melilotus alba Desr. Introduced plant and very common along roadsides, 2745 (DAO).

Melilotus officinalis (L.) Lam. Very common along roadsides and frequently mixed with the foregoing species, 2746 (DAO).

Oxtytropis sericea Nutt. var. *spicata* (Hook.) Barneby Common on upland prairie, 2702 (DAO).

Petalostemon candidum (Willd.) Michx. Locally common on dry slopes, 2701 (DAO).

Petalostemon purpureum (Vent.) Rydb. Common on eroded slopes, 2680 (DAO).

Thermopsis rhombifolia (Nutt.) Richards. Very common on prairie and along roadsides, 2754 (DAO).

Trifolium repens L. Common in lawns on campgrounds, 2690 (DAO).

Vicia americana Muhl. Local in thickets on alluvial flat, 2761. Common in grasslands, 2176 (UC).

LINACEAE

Linum lewisii Pursh Common on upland prairie, 2151 (DAO, UC). Also common on grass slopes, 2704 (DAO).

Linum rigidum Pursh Common on upland prairie, 2758 (DAO).

ANACARDIACEAE

Rhus radicans L. var. *rydbergii* (Small) Rehder Locally common in shaded ravine and among bushes near campsite (not collected).

Rhus trilobata Nutt. Common on dry slopes, 2173 (UC), 2697 (DAO).

MALVACEAE

Sphaeralcea coccinea (Pursh) Rydb. Common on upland prairie, often forming conspicuous patches on disturbed areas, 2154 (UC). Also locally common on upper eroded slopes, 2812 (DAO).

VIOLACEAE

Viola rugulosa Greene Locally in thickets at base of cliff on dry slope, 3271 (UC).

LOASACEAE

Mentzelia decapetala (Pursh) Urban & Gilg Specimens have been found scattered throughout the park on dry eroded slopes, 2643 (DAO).

CACTACEAE

Mamillaria vivipara (Nutt.) Haw. Locally common on stony areas in prairie grasslands, 3463.

Opuntia polyacantha Haw. Common on dry prairie grasslands and dry upper slopes, 2658 (DAO).

ELAEAGNACEAE

Elaeagnus commutata Bernh. Locally common shrub of light soils on slopes, 2837 (DAO).

Shepherdia argentea Nutt. Locally common along streams in coulees, 2157 (UC).

ONAGRACEAE

Epilobium glandulosum Lehm. Common on river bank, 2689 (DAO).

Gaura coccinea Pursh Common on dry slopes, 2177 (UC). Also common on upland prairie along roadsides, 2763 (DAO).

Oenothera biennis L. var. *hirsutissima* Gray Local on dry sandy alluvial flat, 2665 (DAO).

Oenothera caespitosa Nutt. Common on heavy soils on slopes, 2155 (DAO, UC).

Oenothera nuttallii Sweet Locally common on sandy alluvial flat, 2726 (DAO).

UMBELLIFERAE

Cicuta maculata L. var. *angustifolia* Hook. (*C. douglasii* (DC.) Coult. and Rose) Local along river bank, 2740 (DAO). (Det.-Boivin)

Lomatium macrocarpum (Hook. & Arn.) Coult. & Rose Locally on dry slopes, 3265 (UC).

Musineon divaricatum (Pursh) Nutt. var. *hookeri* T. & G. Locally common on dry prairie grasslands, 3227 (UC).

CORNACEAE

Cornus stolonifera Michx. Common on river bank, 2748 (DAO). Also frequent in sheltered locations on alluvial flat, 2153 (UC).

PRIMULACEAE

Dodecatheon radicatum Greene Locally common on grassy slopes, 3234.

Glaux maritima L. var. *angustifolia* (Collected by Boivin, 12285 June 27, 1958).

ASCLEPIADACEAE

Asclepias speciosa Torr. Infrequent in moist grasslands on alluvial flat, 2644 (DAO).

Asclepias viridiflora Raf. (Collected by Sexsmith, July 13, 1941).

Asclepias viridiflora var. *linearis* (A. Gray) Fern. (Collected by Sexsmith, July 13, 1941).

POLEMONIACEAE

Collomia linearis Nutt. Common on river bank, 3477 (UC).

Phlox hoodii Richards. Common on dry upland prairie and slopes, 3723.

BORAGINACEAE

Cryptantha bradburiana Payson Common on dry slopes, 2171 (DAO, UC). Also common on upland prairie, 2762 (DAO).

Lappula deflexa (Wahl.) Garche var. *americana* (Gray) Greene (*Hackelia americana* (A. Gray) Fern.) Common among thickets on dry alluvial flat, 2693 (DAO).

Lappula floribunda (Lehm.) Greene (*Hackelia floribunda* (Lehm.) I. M. Johnston) Local in moist meadow of alluvial flat and margin of beaver pond in stony coulee, 3258 (UC).

Lappula redowskii (Hornem.) Greene (Collected by Sexsmith, June 17, 1962).

Lithospermum ruderale Lehm. Locally on grassy slopes, 2664 (DAO).

LABIATAE

Dracocephalum nuttallii Britt. Common on river bank, 3475.

Mentha arvensis L. var. *villosa* (Benth.) S. R. Stewart Common on river bank and stream banks, 2723 (DAO).

Monarda fistulosa L. var. *menthaefolia* (Graham) Fern. Local in thickets near dry alluvial flat, 2649 (DAO).

Nepeta cataria L. Scarce, in one locality among thickets on disturbed alluvial flat, 2645 (DAO).

Stachys palustris L. var. *pilosa* (Nutt.) Fern. Locally common in thickets on alluvial flat, 2789, 2691 (DAO).

SCROPHULARIACEAE

Orthocarpus luteus Nutt. Common on dry upland prairie, often occupying large areas, 2742 (DAO).

Penstemon albidus Nutt. Locally common on grassy slopes, 3230 (UC).

Penstemon nitidus Dougl. Common on dry eroded slopes, 2716 (DAO).

OROBANCHACEAE

Orobanche fasciculata Nutt. Locally parasitic on *Artemisia frigida* on dry open prairie, 2666A (DAO).

Orobanche ludoviciana Nutt. Locally parasitic on *Artemisia frigida* on dry open prairie, 2666 (DAO).

PLANTAGINACEAE

Plantago major L. Common weed along roadside and in waste places, 2681 (DAO).

Plantago patagonica Jacq. (P. *purshii* R. & S.) Locally common on alluvial flat, 2722 (DAO).

RUBIACEAE

Galium boreale L. Very common along roadsides and in grassy prairie, 2706 (DAO).

CAPRIFOLIACEAE

Symphoricarpos occidentalis Hook. Common shrub in thickets on alluvial flat, 2731 (DAO).

CAMPANULACEAE

Campanula rotundifolia L. Locally common on dry slopes, 2694 (DAO).

COMPOSITAE

Achillea millefolium L. Common on upland prairie, 2721 (DAO).

Agoseris glauca (Pursh) Raf. Uncommon in grassy prairie, 2164 (UC), 2163. Also local on upper grassy slopes, 2717 (DAO).

Agoseris glauca (Pursh) Raf. var. *agrestis* (Osterh.) Q. Jones Local on prairie grassland, 3260.

Antennaria nitida Greene Common on dry prairie grasslands, 3235 (UC).

Antennaria parviflora Nutt. (*A. aprica* Greene) Common on dry upland prairie, 2772 (DAO). Also common on dry slopes, 2771 (DAO).

Artemisia campestris L. Locally common on slopes, 2698 (DAO).

Artemisia cana Pursh Common shrub of dry slopes, 2668 (DAO).

Artemisia frigida Willd. Very common and predominant species of dry prairie and especially on overgrazed areas, 2751 (DAO).

Artemisia ludoviciana Nutt. var. *gnaphaloides* (Nutt.) T. & G. Common on dry slopes, 2669 (DAO).

Aster ericoides L. var. *commutatus* (T. & G.) Boivin (*A. falcatus* Lindl.) Locally on dry upland prairie, 2738 (DAO). (Det-Boivin, 1962).

Aster hesperius A. Gray var. *hesperius* Locally on damp prairie, 2739 (DAO). Locally common on damp alluvial flat, 2709 (DAO).

Aster laevis L. var. *geyeri* A. Gray Locally common on river bank and alluvial flat, 2711 (DAO).

Chrysopsis villosa (Pursh) Nutt. var. *villosa* Cronq. Common on dry slopes and prairie, 2699 (DAO).

Chrysothamnus nauseosus (Pall.) Britt. Common shrub of dry slopes, 2766 (DAO).

Cirsium arvense (L.) Scop. Common on waste places on alluvial flat, 2660 (DAO).

Cirsium flodmanii (Rydb.) Arthur. Local on moist alluvial flat, 2660 (DAO).

Cirsium undulatum (Nutt.) Spreng. Locally common on dry slopes and along roadsides, 3465 (UC).

Crepis accidentalis Nutt. Uncommon on dry slopes, 2179 (DAO, UC).

Erigeron caespitosus Nutt. Common on open slopes, 2770 (DAO). Also common on dry prairie, 2773 (DAO).

Erigeron canadensis L. Frequent on waste places on alluvial flat, 2728 (DAO). Common on river bank, 2729 (DAO).

Erigeron compositus Pursh Common on dry slopes, 2714 (DAO).

Erigeron glabellus Nutt. Locally on slopes and in prairie grasslands, 2794 (DAO).

Gaillardia aristata Pursh Common on dry slopes and on upland prairie, 2712 (DAO).

Grindelia squarrosa (Pursh) Dunal Very common on open alluvial flat, 2646 (DAO).

Gutierrezia sarothrae (Pursh) Britt. & Rusby Common on dry upland prairie, 2687 (DAO).

Haplopappus spinulosus (Pursh) DC. Common on dry prairie and slopes, 2651 (DAO).

Helianthus annuus L. f. *lenticularis* (Dougl.) Boivin Locally common on sandy alluvial flat, 2676 (DAO). (Det.-Boivin, 1960)

Helianthus petiolaris Nutt. Common on light soil along road and on slopes, 2675 (DAO).

Helianthus nuttallii T. & G. (*H. subtuberosus* Britt.) Infrequent on alluvial flat, 2648 (DAO).

Hymenopappus filifolius Hook. Locally on dry prairie, 2192 (DAO, UC).

Hymenoxys acaulis (Pursh) Parker Locally common on dry unpland prairie, 2183 (DAO, UC). Also on eroded slopes, 2755 (DAO).

Hymenoxys richardsonii (Hook.) Cockerell. Common on dry prairie, 2786.

Lactuca serriola L. Introduced weed, locally common on waste areas on alluvial flat, 2692 (DAO).

Lactuca tatarica (L.) C. D. Meyer var. *heterophylla* (Nutt.) Boivin (*L. pulchella* (Pursh) DC.) Common in low grasslands on alluvial flat, 2663 (DAO).

Liatris punctata Hook. Common on dry slopes and dry prairie, 2700 (DAO).

Lygodesmia juncea (Pursh) D. Don Common on dry sandy prairie, 2750 (DAO). Also locally on dry slopes, 2749 (DAO).

Ratibida columnifera (Nutt.) Wooton & Standl. Locally common on dry prairie, 2763 (DAO).

Senecio canus Hook. Common on dry slopes and upland prairie, 2683 (DAO).

Senecio hydrophiloides Rydb. Locally common in thickets on grassy slopes, 3263 (UC).

Solidago gigantea Ait. var. *leiophylla* Fern. Local on alluvial flat, 2652 (DAO). Also local on river bank, 2655 (DAO).

Solidago missouriensis Nutt. var. *extraria* Gray Uncommon on high upland prairie, 2756 (DAO).

Sonchus arvensis L. var. *glabrescens* Guenth., Grab. & Wimmer (*S. uliginosus* Beib.) Common in waste places, 2667 (DAO).

Taraxacum officinale Weber Common weed of waste places, 2647 (DAO).

Townsendia sericea Hook. Locally common on upland prairie, 3721.

Tragopogon dubius Scop. Introduced and well established weed of dry disturbed areas on upland prairie and along roadsides, 2158 (DAO).

SUMMARY

Writing-on-Stone Provincial Park is located along the Milk River in southern Alberta in close proximity to the Rocky Mountains, the Cypress Hills, and the Sweet-Grass Hills of northern Montana. A Cordilleran element is found in the flora of the more elevated areas of the park.

The present flora developed under continental conditions into a climatic-climax vegetation, as evidenced by the predominance of xeric grasses and herbs. Community boundaries and ectones are often obscured as a result of topographical and soil variations. Preseral community types exist on recently regenerated areas.

A total of 213 taxa are reported for the park.

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Junior Naturalists

Edited by **Joyce Deutscher**, 7200 6th Ave., Regina

FROM YOUR NOTE AND MINE

As I write this it is mid January and an ambitious young fellow walks down the road on his skates on his way to a sheet of ice where he promptly falls, struggles up and falls again. Perhaps by March when you read this the crows will be winging back and the boy will have learned to skate.

My notes tell me that by March 15 last year the wet of the melting snow had encouraged some of the plants along its edge to show the greenness of spring and with careful search the fresh green rosettes of the leafy musineon *(Musineon divaricatum)* could be found. The leaves of the musineon as they expand are carrot-like, the flowers tiny yellow ones grouped closely together in a flattish head or a compound umbel as the botanists prefer to say it. You will find this early spring flower described in *Prairie Wildflowers*, by Lloyd Carmichael, a good book for Juniors who are just starting to learn the identification of prairie flowers.

Ten days after searching out my first musineon last year, I was nibbling the yet unopened buds of the poplar tree. The Sharp-tailed Grouse who had been enjoying the buds were startled away by my approach. I knew the buds of the poplar tree were an emergency food suitable for humans but soon decided that this was no emergency.

On March 27 I found my first mushrooms of the year. The careful drawing I made of them remains unidentified but it helps me recall the freshness and bright orange color of my find.

A week later the red stigmas of the hazel-nut had appeared in "The Valley of the Mushroom." Here is another early spring flower for you to look for; if you know where there are tree squirrels, chances are you can find the hazel-nut shrubs as well. They bloom in the southern part of the province about the end of April. The male flowers are in catkins which are produced before the leaves develop. The slender red stigmas of the female flowers are quite noticeable. The edible nuts are ripe in August but chances are some squirrel or chipmunk has found them first.

How interesting notes are to look back upon! My earliest records date back to when I was ten years old and read like this:

"mar 15 kicked jacks rubber up the isle

"march 16 jack kiked my rubber up the isle

"mar 17 jack put some paper down my nek."

Apparently I was not too interested in nature when I was ten years old. The notes however still make good reading. Do make it a special project of yours this spring to keep a diary or a note book. The notes are for your own enjoyment and use, so even if your teacher does not see fit to give you above a "D" in composition on your report card keep a nature note book anyway.

A ten-year-old from Yellow Creek, Gaylene Mazur, would rather talk about squirrels than boys. She tells us, "We have a pet squirrel that lives in the barn. We made friends by giving it food like peanuts. The squirrel used to run away at first. Now when you give it food, the squirrel folds its hands across its stomach and watches you." It seems to me, Gaylene, that looking after a pet squirrel is a much better hobby than kicking a boy's rubbers up the aisle.

The eleven-year-old girls from Yellow Creek don't mention boys either. Iris Simon found a cabbage butterfly which couldn't wait until spring flying around in their basement. She used the *World Book* to help her identify it. Deborah Shewchuk had a less happy experience. She saw three dead porcupines on the road, an adult and two young. As for Colleen Shewchuk (this young lady doesn't give her age), she has been rabbit watching.

BRIEF ENCOUNTER WITH DEER

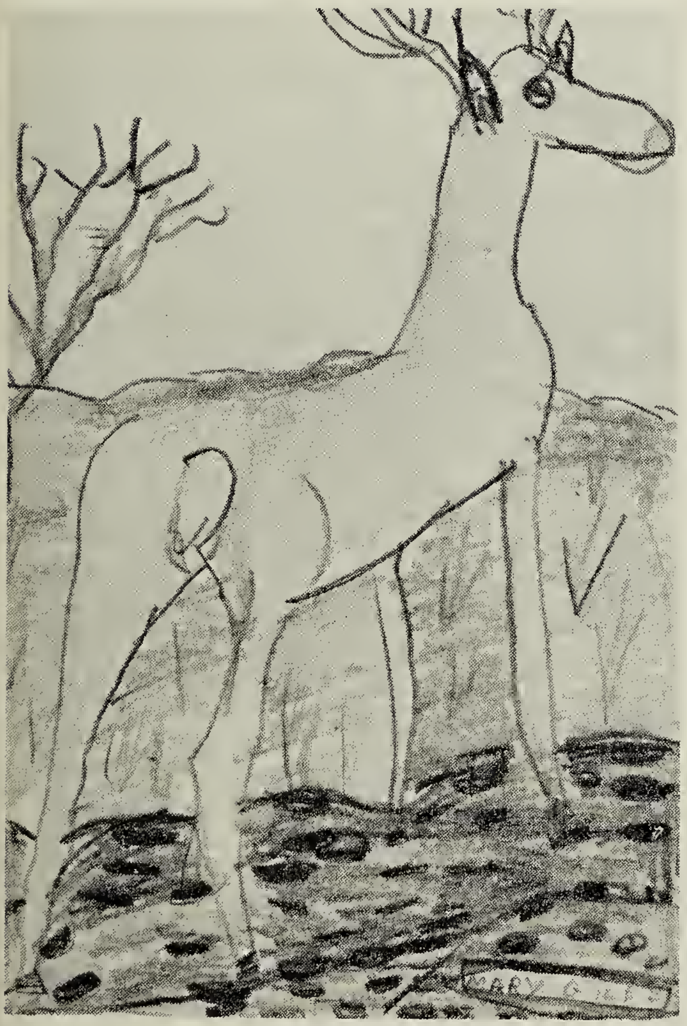
by **Mary Gilles**, Moose Jaw

There was a flash! Then a dash! What did I see? I saw a white-tailed deer.

Our family was on a picnic. I was going back to our car ahead of others. As I trudged across the prairie I happened to glance at a small thicket. I saw the deer there! I did not see it for very long but one glance was enough.

It lifted its graceful head, took one whiff of the air, flashed its tail, and ran. The deer ran fast, very fast indeed. Smaller and smaller it grew until it was only a speck on the horizon.

I turned slowly and somewhat sadly. Never again would I see such a magnificent creature.



White-tailed Deer
Drawn by Mary Gilles

SOME JUNIORS GET STUNG

Both Ellen Kuz and Kenneth Mazur saw wasps. Ellen stood by and watched her cousin get stung and then got stung as well. Kenneth states, "This summer I found some wasps in a manure pile. They were Yellow Jackets. I was going to get rid of them and plugged the entrance in the manure pile. They got mad at me and stung me. Then I left them alone until they were gone. I looked inside and saw how the wasps chewed a hole in the manure pile and how they built their nest." And there Kenneth's story ends abruptly leaving us to wonder just how did the wasps build their nest. Perhaps the wasps came back before Kenneth finished his observations.

THE YEAR OF THE WEASELS

Yellow Creek naturalists are full of weasel stories. That is, all except that girl trapper, Rosemary Nemeth, who runs a trapline three-quarters of a mile long. Last year she caught five weasels; this year she is catching everything except weasels. However, weasels are around notes Bryon Lane who saw one in his back yard carrying a dead rat. Glen Orenchuk watched some dogs trying to dig a weasel out of the snow (Girl trappers take note, Glenn considered "his" weasel too beautiful to trap).

Joan Popiel goes so far as to have a pet weasel which likes to chase squirrels. She adds, "My pet weasel and my pet cat are not very good friends but they play together once in a while." Sherry Chubak saw her weasel after the first snowfall. The dogs saw it too. They barked and the weasel showed its teeth.

Anyone else seen any weasels recently?

SOME JUNIORS KEEP PIGEONS OTHERS HAVE PIGEONS VISIT THEM

Evelyn Lypchuk received a male and a female pigeon from her aunt but unfortunately the cat got them.

She plans on trying to keep pigeons again though.

Gordon Orenchuk has observed that a mother pigeon seems to know when the young are big enough to be pushed out of the nest. Why not tell us how the mother goes about doing this, Gordon, and how the young react? Observations like this are well worth keeping in your note book.

Audrey Lebedowich saw a pigeon fly into their chicken coop. "It would get along quite well with the chickens. It would sit on the roosts when it wanted to. After a week it flew away."

We're glad to hear that pigeons get along better with domestic fowl than they do with domestic cats.

THE RATTLESNAKE ON THE TRANS-CANADA HIGHWAY

by **Colette Isinger,** age 9, Yellow Creek

In the summer of 1967 my father, mother, brother and I went for a trip to Drumheller, Alberta.

Coming back home we drove on the Trans - Canada Highway. We were going quite fast when my father noticed a snake on the highway. My dad backed the car up to look at the snake. We found out it was a rattlesnake. We could hear it rattling a little bit. It was warming its body on the warm pavement. By and by some big trucks with double wheels ran over the snake. Then it was dead.

A RUFFED GROUSE

by **Stella Holinaty,** age 11, Yellow Creek

One day as our father was taking us to school we saw a Ruffed Grouse. The grouse was badly hurt. We picked him up and looked at him. He was grayish in color. He ruffed out his tufts on the side of his neck and then I knew it was a Ruffed Grouse. Dad said that we should take it to school but before we got to school it was dead.

JUNIORS EXPRESS THEMSELVES ABOUT THEIR SECTION

Two Juniors heard from, Wayne Renaud and Mary Gilles, both like the idea of contests. Wayne thinks nature stories would fit nicely into the Newsletter but he wants factual information as well and thinks that "at the age of 16 juniors should start contributing to the senior section. By that age they should be experienced enough to gain a say in the adult section. After all Ornithology is one profession where amateurs can contribute a lot."

Wayne and Mary would both like to see nature hobbies written up complete with illustrations.

As for Wayne he reads the entire *Blue Jay.* He finds it breaks the monotony of reading guide books.

Thanks for letting us hear from you. Any more suggestions?

Send comments about, suggestions for, and contributions to this section to: Mrs. Joyce Deutscher, 7200 6th Ave., Regina.

Letters and Notes

SOME GULL OBSERVATIONS

I have long admired the flight of gulls and riding a tractor affords many opportunities to observe them at close range. On breezy days they often come within 10 feet as they float, dip and wheel with scarcely a wing-beat. It seems to me that there has been a shift in population. Years ago, the Franklin's Gull was predominant with only the odd Ring-billed Gull among them. Now I seldom see large groups of Franklin's, but the Ring-bill is in evidence almost every day all summer, singly or in groups of up to 50. They don't wander like Franklin's but may stay all day in one field following the tractor or just sitting on the ground.

It isn't unusual to see a gull, particularly Franklin's, with only one leg showing beneath the tail coverts. For a long time I assumed that these were birds that had lost one leg. Imagine my surprise one day to see a Ring-bill without any legs showing! I watched it for several hours as I drove, sometimes at less than 10 feet. The bird was healthy, its plumage immaculate. There was no sign of stumps, not a feather out of place underneath the body, only slight bulges where the thighs should be. Eventually the truth came out. I was watching the "legless gull" when suddenly it stooped to pick up an insect. It lowered two perfectly good legs as it hovered, and then tucked them *forward* into the belly feathers and out of sight. Even from close range there was no sign of a leg or foot, only the slight bulge in the plumage. I wondered why one individual would carry its legs forward when the normal posture is back under the tail, very much in view.

A year later came the pay-off. A "one-legged" Ring-bill hovered overhead, then wheeled down wind, swung and came directly toward me. As I watched, it lowered its "good" leg, then produced the other leg from somewhere and vigorously scratched its foot in flight. As it went by me it again became a "one-legged gull."

I was so astonished that I stopped the tractor and, as if to oblige, the bird repeated the manoeuvre exactly. It swung away and again as it approached up wind, down went the visible leg and it was then scratched thoroughly with the other one. Then both legs were retracted, one backwards under the tail, where it was visible, and the other out of sight in the plumage. Has anyone an explanation for this variation in leg posture? —*Frank McLeod*, Dilke.

Editor's Note: Gulls and some other birds are able to hold their feet in either a forward or a backward position when in flight. In the forward position the feet can be tucked into the belly feathers and this possibly helps keep them warm. The feet are presumably tucked into the feathers on cold days or during extended flight. In this connection see the notes on Sandhill Cranes tucking their feet forward (*Blue Jay*, 23:121, 24:47). Gulls, when searching for food by hovering above the ground, may keep one foot out for balance or in preparation for landing. There may, of course, be other explanations for this interesting behaviour. Grebes, while resting on the water, often keep one foot on their back, tucked beneath a wing. They accomplish this by means of a remarkable flexure of the leg, first shaking the foot or holding it aloft, presumably to dry it, then slipping it beneath the wing. It is not known why they do this, but it is apparently done in all seasons. Possibly this is a means of resting the limb. Many birds customarily stand on one leg in evident comfort. It seems reasonable to suppose that folding one or both feet forward when in flight may be simply for comfort.

ATTRACTING HUMMINGBIRDS

All wild birds tend to settle in an area in direct proportion to the amount of food available to support them, and normally they keep out competitors of their own kind. We have attracted hummingbirds to our area by artificially increasing the food supply, until we now are feeding more than 50 pairs of hummingbirds, augmented by their offspring at the end of the nesting season.

We began with the provision of both wild and cultivated flowers in our garden. Flowering wild currant, fuchsia, columbine, honeysuckle, canterbury bell, foxglove, montbresia and huckleberry are very acceptable and enticing to hummingbirds. E. W. Van Blaricom would add blue salvia, scarlet runner bean and monarda, and prairie friends would add the delphinium.

Then we added 10 feeding stations, placed in likely locations adjacent to flowers on stakes several feet above the ground. On the end of each feeder a plastic flower is attached, preferably red. Once they are accustomed to these feeders, they will also come to yellow flowers. The feeders vary in size, but each is a bottle with a rubber cork pierced through with a glass tube. Such corks with glass tubes are available as hamster feeders or hummingbird feeders. Glass tubes are preferred to metal tubes. The right syrup is one cup of sugar to four cups of water, boiled for five minutes. Unboiled syrup will not keep and crystallizes in the feeders, plugging the tubes. The bottles must be kept clean and filled or changed at intervals. The bottles must *always* have food in them, since hummingbirds have a high state of metabolism and feed about every 15 minutes from dawn to dark. To break off or reduce the program would be to sentence the young birds to death, since the number of nests established will be on the basis of the amount of food originally available, and the young consume more than their weight of food every day. We have used more than 150 pounds of sugar in one season.

An observant bird fancier will be amply rewarded for his efforts with these little winged jewels. While I don't recommend a program of the size that ours has become, it has been fascinating and educational for our family and friends.—*Mrs. Myla Watson*, Sechelt, B.C.

Editors' Note: Sechelt is on the coast of Georgia Strait, just north of Vancouver. E. W. Van Blaricom read Mrs. Watson's letter to the Central Okanagan Naturalists' Club on November 7, 1967.

WINTER BIRDING IN ALABAMA

Like the birds, I flew from Saskatoon to Alabama last winter, arriving on December 22, 1966. After two or three days of rain following my arrival, the sun came out bright and warm at seven o'clock in the morning. Instantly the yard burst into colour —not of flowers, but of birds of every hue. Fascinated, my eyes picked out cardinals, blue jays, mockingbirds, towhees, juncos, red-bellied woodpeckers and numerous others that I was unable to identify. What a sight for bird-hungry eyes! Then with binoculars and a good bird book, a summer tanager, a song sparrow, and a savannah sparrow were sighted. And imagine my delight when our dear Canada bird, the white-throated sparrow, joined the throng. But where were the robins? That question was soon answered when I took a walk along an open field, the ground was alive with robins. But in spite of feeders and berries on the bushes they would not come near the house. One day I saw numerous red-breasted birds in the trees and on the telephone wires that looked unfamiliar to me, but when they took flight and soared upward they were lost against the blue sky. Bluebirds, I shouted, scores and scores of bluebirds. Then there was a tawny flash as a brown thrasher flew to cover. We scattered seeds in the garden, and lovely mobile colors sprang up everywhere. The cardinals and blue jays looked especially beautiful among the yellow daffodils.

Just a word about the pecking order. Although all the birds were very amiable, the ecclesiastical cardinal seems to be the "boss man" here in Alabama.—*Mrs. R. E. Swain*, 906 9th Ave., Saskatoon.

AN UNUSUAL ROBIN NEST

In checking 1967 nesting records for the Crescent Beach area, North Surrey, B.C., I came across a rather unusual nest of an American Robin, dated April 28. This nest was in a red cedar tree, approximately eight feet from the trunk of the tree and at the end of a limb, and some 10 feet from the ground. Besides the conventional nesting materials such as coarse and fine grasses and mud, the bird used the following rather bizarre items: soda straws (waxed drinking type), tissue paper, one chewing gum wrapper, various kinds of white and brown string, nylon fishing line, bits of orange-coloured onion sacking, dried bedstraw, and a piece of cellophane! All other nests from this area were of the more usual type. — *Al Grass*, 5666 Rumble St., Burnaby 1, B.C.

My regular winter customer looks at his picture printed in a recent issue of the *Blue Jay*.—F. W. Kent, 302 Richards St., Iowa City, Iowa.

ENCOUNTER WITH A GOLDEN EAGLE

On December 17, 1966, Bruce and Robert Bessant and I were walking down the edge of a high shale bank which drops into the Souris River when suddenly an extremely large and dark bird flew out from the edge of the river bank below us. By the time I spotted the bird it had flown a considerable distance down the river, flying very close to the surface of the ice. After flying between a quarter and a half mile away it perched in a birch tree which was overhanging the river. We had a pair of 6x30 binoculars but were unable to identify it at that distance. We decided to try to get closer to it and started down the bank. On the way down I found the spot where the bird had been sitting under a stunted oak tree. It had evidently been sitting there for some time, for the snow was well flattened down and had started to melt. Droppings at the site were very watery-looking and greenish-yellow, and had stained much of the snow. When we reached the river, the bird flew out of the birch tree and landed on the snow-covered ice, just as if it had caught something. It sat in this position for a few minutes and appeared to be pecking at something at its feet. We were close enough to tell by its size that it was an eagle, but we were still not sure of the species.

Continuing on down the river towards the eagle, we worked our way through an island in the river which was thickly covered with young willows. When we came out of the willows, the eagle was nowhere in sight. I continued down the edge of the river with my two young friends close behind. When I reached the spot on the river where the eagle had been sitting, I was amazed to see it sitting up on the edge of the river bank on a deer trail. It made no move to fly away and we were so close we could see the golden flecks on the back of its neck. We could also see that its legs were feathered almost to the toes. We approached it and it then ran into the bush, but still would not fly. We walked to within eight or 10 feet of it several times to try to make it fly, but it would only walk away from us. In fact, it threatened us when we approached too close. There was no sign of a wound, but it appeared to be sick for its feathers were very rough and untidy. It also appeared to be hungry. We decided it would be best to leave it alone for we did not have anything with which to handle it. We went back onto the river and measured where the eagle's wing tips had touched the snow just before it landed. From two such spots measured, I judged that its wingspread was between six and seven feet. There was no sign that it had been feeding on anything at this site. We then left the area. I returned with a camera and with a friend on December 19, but we could not find the eagle. There were so many deer tracks that it was impossible to look for its trail.

We sighted a Golden Eagle which was in excellent shape in this same area in the spring of 1967 and in November 1967, Mr. A. Black of Brandon and I saw two Golden Eagles and one mature Bald Eagle soaring in the same general area.—*E. J. Bud White*, 410 Laurence Cres., Brandon, Man.

UNUSUAL EAGLE BEHAVIOUR

During a severe spell of weather in January, 1967, a white pigeon wearing a band appeared on my farm, roosting in the garage. I caught and fed it several times and it remained for a couple of weeks. It would not stay in the barn or associate with the barn pigeons, and it was not able to forage as they did. If I hadn't put out feed on the roof it would probably have starved.

One afternoon my wife called me to see a large black bird flying through the barn yard. Looking out the window I saw a Golden Eagle perched in the top of a large evergreen about 70 yards from the house. I have never seen an eagle this close to buildings before. After about a minute the eagle launched itself and flew directly toward the house at high speed. It was thrilling to see such a large bird approaching headlong! It held the direct course until it disappeared from our view above the roof of the low verandah. There was no sound on the roof and when I went out there was no sign of the eagle or the pigeon. I believe that the pigeon was the target of the eagle's bold flight for it was not seen again. I assume that hunger made the eagle extra bold and that it attacked the pigeon as it sat on the verandah roof. I have no way of knowing if the pigeon was picked off the roof or if it was captured in flight, but the former seems more likely.—*Frank McLeod*, Dilke.

PREDATORS

It seems to me that there are too many people writing to the *Blue Jay* in support of predators. While predators are all right to clean up a little surplus, when there is no surplus I feel that there should not be any predators either. Last year there were only six Gray Partridges left here out of 30 which started the winter, and then one of the falcons came around and I did not see another partridge until fall, when one family of 15 showed up. This was probably a late hatch after I had shot the crows and magpies! Then a couple of weeks ago a Great Horned Owl took 10 of them in a week. While it is true that birds of prey take many rodents in the summer months, in the winter they have to catch rabbits and partridges, or die, and since there is a shortage of these latter species, why protect predators?

Does anybody know if the Western Kingbird is prone to nesting problems? Last year I checked two nests after they were abandoned suddenly and found two dead young in one and one bird dead in the other, with its toe tangled in the wool lining. This year there were three pairs around the buildings, and then all of a sudden before the first of August, they *all* vanished.—*Richard Bothner*, Beechy.

BIRD NOTES FROM OXBOW

I have been intending for some time to write you a note in regard to song birds trying to rid their nests of cowbird eggs. This past summer, a female Brewer's Blackbird covered over a cowbird's egg along with one of her own, and then apparently deserted the nest. A nest has been built in that young evergreen each spring for years, but a nest has never been successful there, although several in the other trees in the same row of evergreens are always lucky!

Birds are scarce this winter at Oxbow. We have had a chickadee only twice, and today (January 9) was his first trip to the feeder. There is the odd woodpecker in the bluffs, but none are coming to the feed tray as they usually do. One flock of Bohemian Waxwings was here on a miserable day in December. We have seen Snow Buntings and two Snowy Owls, and a few Gray Partridges and very few Sharptails. Female pheasants have been seen four times, and friends have seen a male — we hope the weather doesn't kill them, for they are scarce here. Horned Larks are appearing now, although there were none in December, but there are no redpolls.

Occasionally we hear a Great Horned Owl, so we hope we shall have a family for Dr. Stuart Houston to band in 1968. He did band a pair here in 1966 and reported the recovery of one of them in the United States, a long way from here. — *Mrs. Hazel Paton*, Oxbow.

CHRISTMAS BIRD COUNT

WETASKIWIN, Alberta, Dec. 25; about the farmyard; temp. 18°; no wind; overcast in afternoon; 4 species, 59 individuals. Downy Woodpecker, 2; Black-billed Magpie, 3; Black-capped Chickadee, 4; House Sparrow, 50. (Add: Ruffed Grouse, 1, Dec. 26; Blue Jay, 4, Dec. 26; Bohemian Waxwing, 3, Dec. 27; Evening Grosbeak, 8, Dec. 28).—*Fred H. Pegg.*

RE PLANT SECTION

I will not be able to make regular contributions to the Plant Section of the *Blue Jay* for the next two years. I am beginning a programme towards a Ph.D. in weed science in Winnipeg this January. I plan to take some classes and do some instructing from January to April, work in Swift Current for the summer months and then move with my family to Winnipeg for the next two years.—*Keith F. Best*, Box 1030, Swift Current.

RECORD LILY

Mrs. Oliver Olafson, Box 88, Tantallon in "Garden Exchange" in the *Western Producer*, August 10, 1967 reports seeing a Prairie Lily with nine flowers and one bud. She is anxious to know if this is a record. — *Bill Richards*, 233 Taylor St. E., Saskatoon.

PRE-PUBLICATION PRICE

Dr. B. Boivin's *Flora of the Prairie Provinces* is being printed by photo-offset in Ann Arbor. It will be in four parts, and the first part of 202 pages should be available soon. All four parts should be out in 1968.

The subscription or pre-publication price is only $10, plus tax, for the set. If you send in your money now we will send you the first part and the three remaining parts will be sent direct from Ottawa as soon as they are available. A higher post-publication price will go into effect as soon as all four parts are available. — The *Blue Jay Bookshop*, Box 1121, Regina, Sask.

USED BOOKS WANTED

Do you have books on birds, plants, minerals, or any natural history or natural science subject for sale? Please send your list for appraisal to W. W. McGregor, 59 Divadale Drive, Toronto 12, Ontario.

The Blue Jay Bookshelf

HOURS AND THE BIRDS: A SASKATCHEWAN RECORD. By R. D. Symons. 1967. University of Toronto Press, Toronto. 224 pp. Illus. by the author with black - and - white sketches and 17 paintings reproduced in colour. $12.50. Available from the Blue Jay Bookshop, Box 1121, Regina, Sask.

Look for beauty and you will find it.

Robert Symons followed this directive. In *Hours and the Birds*, he shares the rewards of his seeking. Author, artist, ornithologist and rancher, few are the corners of this province of his adopted country that he has not penetrated, sketching, observing, and recording nature.

Half a century's harvest is contained in the book about those who neither sow nor reap, who share our Father's world. Intuitive brush and type illumine pages with incidents in a career of enviable variety and accomplishment.

Love for and intimate acquaintance with his subjects so intensifies impact that the reader meets the living bird in its accustomed place rather than as a mounted specimen. A human document, vital, enriching, stimulating.

To a sensitive naturalist the universe offers its wealth. He may gather the fruit of seed sown at its genesis. No season is dull, all weathers are one.

The author rejoices amid great congregations of birds. Family flocks hold his interest. Not least entrancing is the individual who, like Kipling's cat, "walks by its wild, lone self." Thousands of migrant wildfowl have thrilled him. He has camped beside the curlew on the wide open ranchland. He knows the plover of the Arctic tundra. His eye is intrigued, too, with the dull wee sparrow in the grass.

Definite beliefs are plain in the text: tree and flower protection, opposition to predator killing campaigns, preservation of parks against commercial exploitation and conviction that future of our wildlife depends on increasing militancy on its behalf. Esthetic principles have a practical value and deserve more recognition in our materialistic civilization.

Hours and the Birds presents wild friends we may meet at work or play. Who know them not will realize how much of companionship, beauty and even grief — for nature lovers are often made to mourn — they have missed. The understanding reader lays down the lovely volume, his awareness heightened and pride increased in our heritage, the outdoor aviary that is Saskatchewan.—*Elizabeth Cruickshank, Regina.* Reprinted from *The Leader-Post*, January 27, 1968.

A TIME FOR FUN. By Kerry Wood. 1967. Published by the author. Box 122, Red Deer, Alberta. $3.95. Postpaid autographed copies may be obtained directly from the author.

Have you wondered how you could use that piece of driftwood you picked up on your vacation? Have you ever wanted to try your hand at creating beautiful jewelry from pebbles and rocks? Did you know that you can create many exciting things from materials gathered outdoors summer and winter? Kerry Wood in his book *A Time For Fun* describes a number of different projects for people interested in handicrafts and hobbies.

He describes among other things how and where to look for Indian artifacts, how to make miniature kites "that will give pleasure to anyone whenever there is a wind blowing mares tails across the skies", how to make delightful bone-heads from vertebrae, candelabra, letter openers and lamp bases from a variety of woods, how to fry marbles, how to use horns and antlers, and even how to use branches of trees which have been infected with insect galls. And for vacation he gives instruction on the proper packing of a knapsack, the setting up of camps and a number of simple methods for cooking outdoors.

This book with its black and white illustrations by Helen R. White will appeal to those interested in handicrafts and hobbies, particularly leaders of youth groups and teachers. Parents will find it a welcome gift to children who like collecting and building objects. This book gives a description of how to collect and finish a number of raw materials. Most of the hobbies described require time and effort but do have many rewards, and by participating in these hobbies you can discover a great deal about nature and can learn about plants and animals in their environment.

From the book you will discover that any time of year is *A Time For Fun*.—*Gwen Jones*, Regina.

AN ALBUM OF PRAIRIE BIRDS. By Doug Gilroy. 1967. Modern Press, Saskatoon. 71 pp. with plates. $3.50.

Every member will wish to purchase this new book, particularly if he has been fortunate enough to attend any of Doug Gilroy's illustrated lectures. Doug's 35mm. colour photographs have won prizes in international competitions and one appears each week with his nature column in the new colour section of the *Western Producer*. The Modern Press are to be congratulated for the fidelity of the good-sized reproductions of 33 of Gilroy's photographs that constitute this book. Only the White Pelican, Downy Woodpecker and Harris' Sparrow are a bit disappointing. One or two paragraphs of text, directed to the novice, accompany each photograph.

Doug's weekly column has for 14 years been one of the most widely read features in Western Canada's largest farm newspaper, reaching over 150,000 homes. The interest generated by such a column is inestimable, and it is an efficient carrier of the conservation message. This new book, at the very reasonable price of $3.50, will help further an interest in nature among the rural population of the prairies. Congratulations, Doug!—*C. Stuart Houston*, Saskatoon.

OUTDOORS USA, 1967 Yearbook of Agriculture. Govt. Printing Office, Washington, D.C. 20402. 408 pp. Illus. $2.75.

This, the latest issue of the U.S. Department of Agriculture yearbooks, is a book that contains a wealth of information not only for the agricultural industry, but for all persons interested in conservation, natural history and the outdoors. Man's relationship with the world of nature is presented in an imaginative way. As the foreword states: "A mountain symbolizes man's goals, aspirations, and yearnings for a better life . . . From the mountaintop, we have a sweeping view of man's total environment — an environment we share with other living things."

The Yearbook is divided into four main sections. It starts out with a 32-page colour section. The remainder of the book is illustrated with photos and drawings to bring out the theme of each chapter, whether in conservation, natural history, or recreation.

Those of us interested in natural history will find the item on the Whooping Cranes interesting, as well as many other articles throughout the book. Although the book is primarily for Americans, we in Canada can transpose a great deal of the information for our own benefit.—*Anthony J. Hruska*, Gerald.

ALBERTA, A NATURAL HISTORY. This is a beautiful book with contributions from a large number of naturalists in Alberta on various aspects of the natural history of their province. Subsidized by the Alberta utility companies as a Centennial project, it has a handsome format and illustrations and would make an ideal gift. The first printing of the book has been sold out, and a second printing is now being undertaken, with the price, $7.50. Orders for the second edition should be placed as soon as possible, with

John Price
Secretary, The Calgary Bird Club,
88 Galway Crescent, S.W.,
Calgary, Alberta.

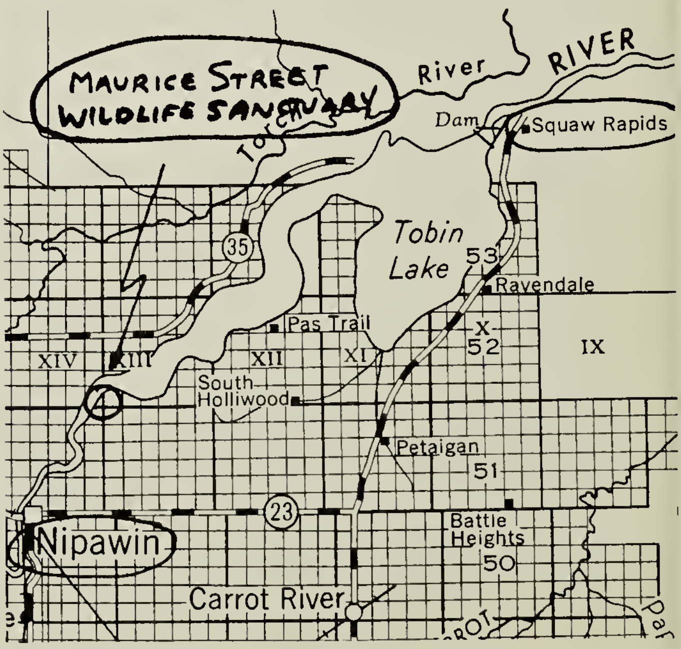
SNHS SUMMER MEET, 1968

Nipawin, Saskatchewan, June 14 - 16

Saskatchewan River at Maurice Street Wildlife Sanctuary.

Hosts Stan Riome and his son David on a winter bird hike at Nipawin, January 1968.

The SNHS Summer Meeting will be held June 14-16 on the Saskatchewan River at Nipawin. The feature attraction will be visits to the Maurice Street Wildlife Sanctuary established in 1967 in memory of Maurice Street of Nipawin. Further information will appear in the Newsletter. General convener for the meet is Dr. Stan Riome, Nipawin.



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